

# REPAIR MANUAL 2002-2006

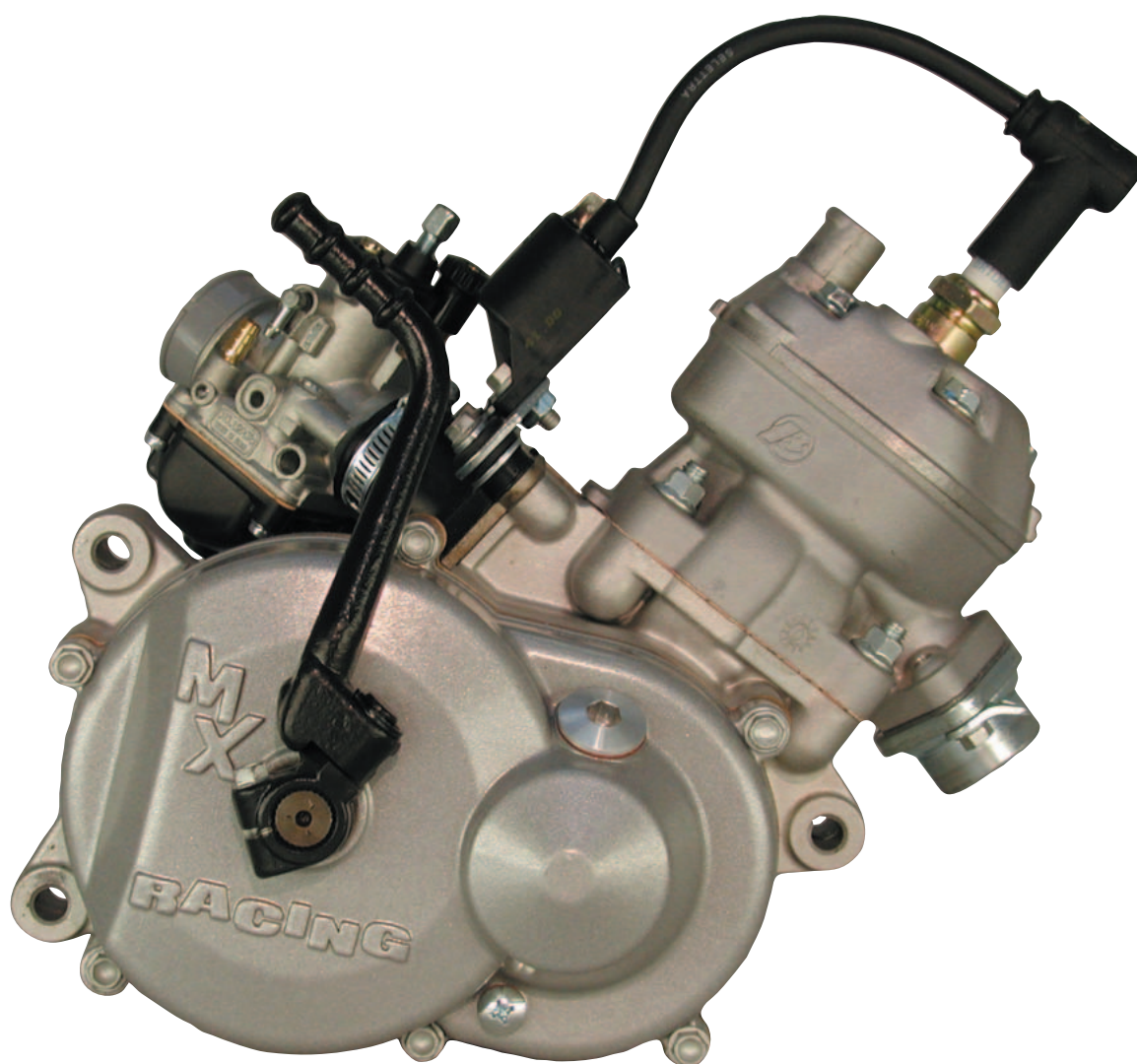
**50 AC/LC**

REPARATURANLEITUNG

MANUALE DI RIPARAZIONE

MANUEL DE REPARATION

MANUAL DE REPARACION



Art.Nr.: 3.206.028-E

**KTM**



**REPAIR MANUAL 2002-2006**  
**50 AC/LC**



KTM Group Partner





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# IMPORTANT INFORMATION/UPDATING INSTRUCTIONS

To be able to continue using the existing loose-leaf repair instructions, simply print the following pages and insert them in the existing repair instructions:

1, 3, 7, 9, 13, 15, 17, 20, 21, 33, 46, 61, 63, 74, 76 - 81, 82, 84, 86, 87

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## KTM REPAIR MANUAL IN LOOSE-LEAF FORM

### STORING THE REPAIR MANUAL IN THE BINDER

- Put the index into the binder.
- Put the front page of the repair manual (210x297 mm) into the transparent pocket provided for this purpose on the outside of the binder.
- Put the spine label (170x45 mm) into the transparent pocket provided for this purpose on the spine of the binder.
- Put the summary list of contents (150x297 mm) into the transparent pocket provided for this purpose on the inside of the binder or insert this page on the beginning of the manual.
- Then insert the individual chapters of the manual between the sheets of the index according to the page number printed in the right bottom corner of each page.  
Example: page no. 3-5, 3 = chapter 3, 5 = page 5. All pages with a page number that begins with the digit 3, for example, must be put under the index heading "Chapter 3".
- Index sheets that have not been marked with a certain chapter are for your personal convenience. The respective headings can be entered in the list of contents.





## EXPLANATION - UPDATE

This repair manual contains the following supplements:

<b>3.210.24-E</b>	<b>Repair Manual 50 AC/LC</b> Basic version Model year 2002	<b>5/2001</b>
<b>3.210.64-E</b>	<b>Updating of Rep.Manual 3.210.24-E</b> Model year 2003 (Engine number with first digit „3“)	<b>5/2002</b>
<b>3.206.010-E</b>	<b>Updating of Rep.Manual 3.210.24-E</b> Model year 2004 (Engine number with first digit „4“)	<b>5/2003</b>
<b>3.206.018-E</b>	<b>Updating of Rep.Manual 3.210.24-E</b> Model year 2005 (Engine number with first digit „5“)	<b>4/2004</b>
<b>3.206.028-E</b>	<b>Updating of Rep.Manual 3.210.24-E</b> Model year 2006 (Engine number with first digit „6“)	<b>7/2005</b>

**Modification / Updating:**

Technical Details Model 2006, Changing brake fluid, Special Tools,  
Technical Specifications, tightening torques, Periodic Maintenance Schedule



## INTRODUCTION

This repair manual offers extensive repair-instructions and is an up-to-date version that describes the latest models of the series. However, the right to modifications in the interest of technical improvement is reserved without updating the current issue of this manual.

A description of general working modes common in work shops has not been included. Safety rules common in the work shop have also not been listed. We take it for granted that the repairs are made by qualified professionally trained mechanics.

Read through the repair manual before beginning with the repair work.

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**⚠                      WARNING                      ⚠**

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**STRICT COMPLIANCE WITH THESE INSTRUCTIONS IS  
ESSENTIAL TO AVOID DANGER TO LIFE AND LIMB.**

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**!                      CAUTION                      !**

---

**NON-COMPLIANCE WITH THESE INSTRUCTIONS CAN LEAD  
TO DAMAGE OF MOTORCYCLE COMPONENTS OR RENDER  
MOTORCYCLES UNFIT FOR TRAFFIC !**

**„NOTE“ POINTS OUT USEFUL TIPS.**

Use only ORIGINAL KTM SPARE PARTS when replacing parts.

The KTM high performance engine is only able to meet user expectations if the maintenance work is performed regularly and professionally.



REG.NO. 12 100 6061

In accordance with the international quality management ISO 9001 standard, KTM uses quality assurance processes that lead to the highest possible product quality.

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## REPLY FAX FOR REPAIR MANUALS

We have made every effort to make our repair manuals as accurate as possible but it is always possible for a mistake or two to creep in.

To keep improving the quality of our repair manuals, we request mechanics and shop foremen to assist us as follows:

If you find any errors or inaccuracies in one of our repair manual - whether these are technical errors, incorrect or unclear repair procedures, tool problems, missing technical data or torques, inaccurate or incorrect translations or wording, etc. - please enter the error(s) in the table below and fax the completed form to us at 0043/7742/6000/5349.

NOTE to table:

- Enter the complete item no. for the repair manual in column 1 (e.g.: **3.210.028-E**).  
You will find the number on the cover page or in the left margin on each right page of the manual.
- Enter the corresponding page number in the repair manual (e.g.: **5-7c**) in column 2.
- Enter the current text (inaccurate or incomplete) in column 3 by quoting or describing the respective passage of the text. If your text deviates from the text contained in the repair manual, please write your text in German or English if possible.
- Enter the correct text in column 4.

Your corrections will be reviewed and incorporated in the next issue of our repair manual.

Item no. of repair manual	Page	Current text	Correct text

Additional suggestions, requests or comments on our Repair Manuals (in German or English):

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**Name mechanic/shop foreman:**

**Company/work shop:**



# GENERAL INFORMATION

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## CLEANING

Clean your motorcycle regularly in order to keep its painted finish looking shiny and new.

The best manner would be to use warm water that has been mixed with a commercially available washing detergent and a sponge. The hard dirt can be removed before with the help of a soft water jet.

!

### CAUTION

!

NEVER CLEAN YOUR MOTORCYCLE WITH A HIGH-PRESSURED CLEANER OR A HIGH-PRESSURED WATER JET. OTHERWISE THE WATER MIGHT RUN INTO THE ELECTRICAL COMPONENTS, CONNECTORS, SHEATHED CABLES, BEARINGS, CARBURETOR ETC. AND CAUSE MALFUNCTIONS, I.E., LEAD TO THE PREMATURE DESTRUCTION OF THESE PARTS.

- You should use commercially available detergents to clean the motorcycle. Heavily soiled parts should also be cleaned with the help of a paint brush.
- Before cleaning with water, plug the exhaust pipe to prevent water ingress.
- After the motorcycle has been rinsed with a soft water jet, it should be dried by air pressure and a cloth. Then take a short drive until the engine has reached its operating temperature, and also operate the brakes. The heat also causes the water at the inaccessible parts of the engine and the brakes to evaporate.
- Slide back the protective covers on the handlebar-mounted instruments so that any water that may have seeped into this part of the motorcycle is allowed to evaporate.
- After the motorcycle has cooled down, oil and grease all the gliding bearing parts. Also treat the chain with a chain spray.
- To prevent failures in the electric system, you should treat the short circuit button with a contact spray.

## STORAGE

If you want to put your motorcycle away for longer periods of time, please observe the following instructions:

- Clean motorcycle thoroughly (see chapter: CLEANING)
- Change engine oil (old engine oil contains aggressive contaminations).
- Check antifreeze and amount of cooling liquid.
- Let the engine warm up again, close fuel tap and wait until the engine dies off by itself. In this way, the carburetor jets are prevented from becoming resin-clogged by the old fuel.
- Remove spark plug and fill in approx. 5 ccm of engine oil into the cylinder through the opening. Actuate kick-starter 10 times in order to distribute the oil onto the cylinder walls and mount the spark plug.
- Let fuel flow out of tank into an appropriate basin.
- Correct tire pressure.
- Lubricate bearing points of the control levers, foot rests, etc. as well as the chain.
- The storage place should be dry and not be subject to overly great temperature fluctuations.
- Cover the motorcycle with an air permeable tarpaulin or blanket. Do not use non-air-permeable materials, as possible humidity might not be able to escape and thereby cause corrosion.

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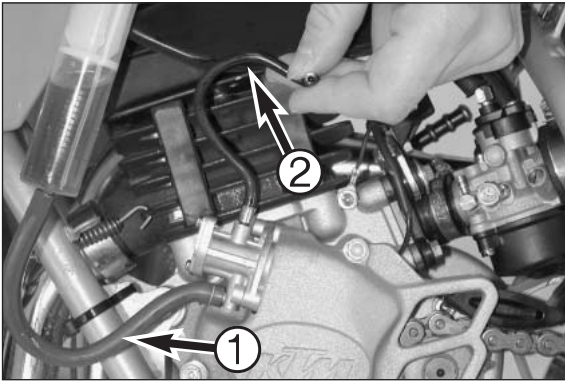
### CAUTION

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IT WOULD BE VERY BAD TO LET THE ENGINE RUN FOR A SHORT TIME DURING THE STORAGE PERIOD. THE ENGINE WOULD NOT GET WARMED UP ENOUGH AND THE THUS DEVELOPED STEAM WOULD CONDENSE DURING THE COMBUSTION PROCESS AND CAUSE THE EXHAUST TO RUST.

### USE AFTER PERIOD OF STORAGE

- Fill up tank with fresh fuel.
- Check motorcycle as before each start (see driving instructions)
- Take a short, careful test ride first.

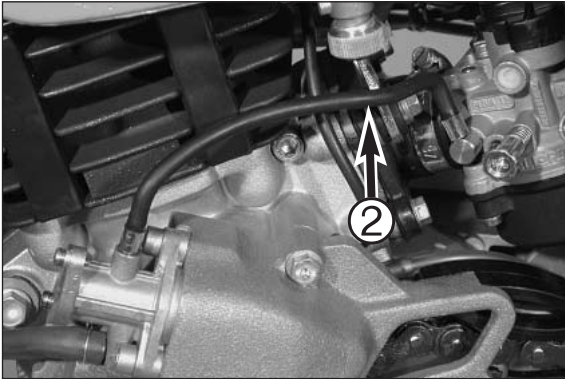


### Bleeding oilpump for separate lubrication up to model 2003

Clamp oil lines ① and ② as shown.

Add 2 stroke engine oil (for example Motorex Cross Power 2T) with a syringe until the bubble-free oil starts to leak out of the line ②.

After bleeding the oil pump, mount both oil lines and fill the oil tank with 2 stroke engine oil (for example Motorex Cross Power 2T).

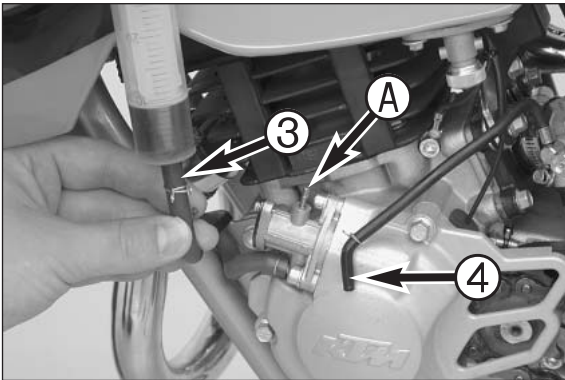


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#### CAUTION

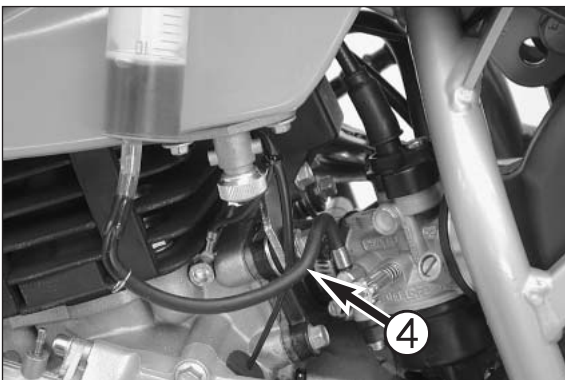
!

HOSE ② LEADING FROM THE OIL PUMP TO THE CARBURETOR MUST BE INSTALLED WITHOUT KINKS.



### Bleeding the oil pump for the separate lubrication from the 2004 model

Disconnect the oil line ③ from the oil tank and oil line ④ from the oil pump. Add two-stroke engine oil for separate lubrication with a syringe until the bubble-free oil leaks out of hole A on the oil pump. Connect the oil line ② to the oil tank. Use the syringe to bleed the oil line ④ to the carburetor and connect to the oil pump.



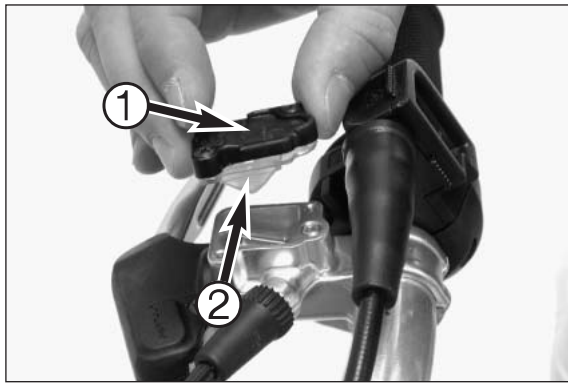
Afterwards, fill the oil tank with two stroke engine oil (e.g.: Motorex Cross Power 2T).

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#### CAUTION

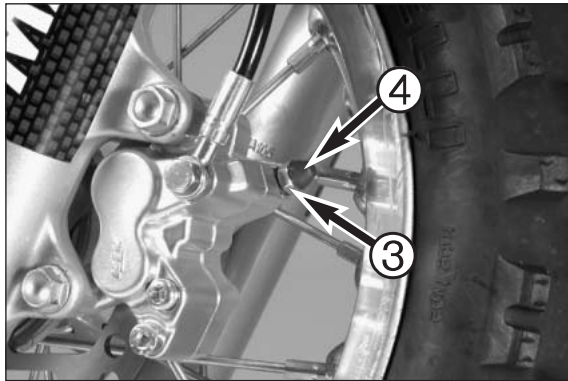
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ALWAYS MAKE SURE YOU RUN THE OIL HOSES WITHOUT KINKS.

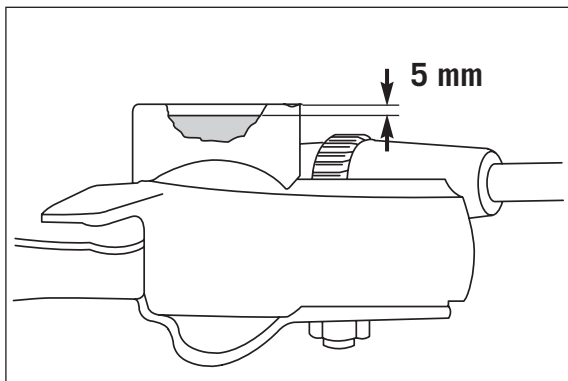


### Changing front brake fluid (not Mini Adventure)

- Move the hand brake cylinder into horizontal position.
- Disassemble the cover ① together with the rubber boot ② from the brake fluid reservoir.
- Press the brake caliper pistons all the way back.
- Use a syringe to extract the used brake fluid and add fresh DOT 5.1 brake fluid (Motorex Brake Fluid DOT 5.1).



- Use a commercial extractor (shop equipment) to extract the used brake fluid out of the system through the bleeder screw ③ on the brake caliper. Make sure the brake fluid reservoir is always filled with enough fresh brake fluid.
- Tighten the bleeder screw ③ and attach the dust cap ④ again.



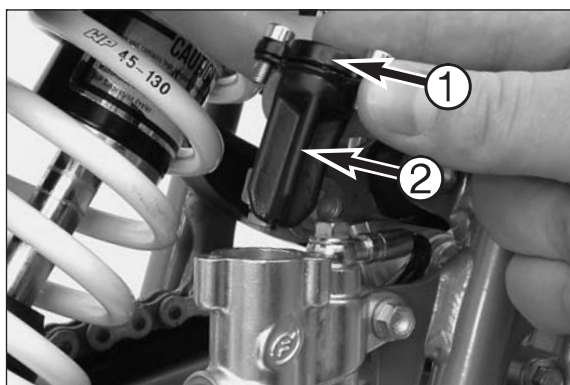
- Add DOT 5.1 brake fluid (Motorex Brake Fluid DOT 5.1) up to 5 mm under the top edge of the reservoir. Remount the rubber boot, cover and screws.
- Wash off any overflowing or spilled brake fluid with water.
- Actuate the hand brake lever until you feel the point of pressure.

!

### CAUTION

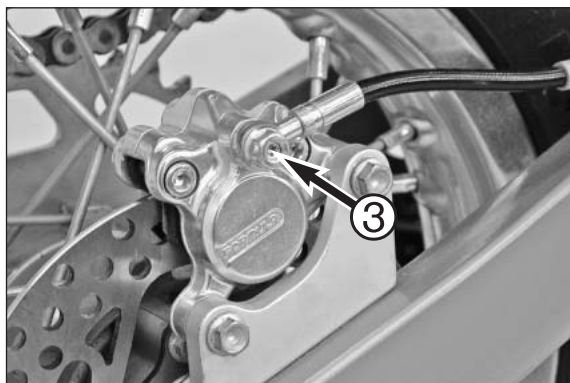
!

- NEVER USE DOT 5 BRAKE FLUID. IT IS BASED ON SILICONE OIL AND DYED PURPLE. GASKETS AND BRAKE HOSES WILL BE DAMAGED IF DOT 5 BRAKE FLUID IS USED.
- BRAKE FLUID CAN CAUSE SKIN IRRITATIONS. AVOID COMING INTO CONTACT WITH THE SKIN OR EYES. IF BRAKE FLUID SPLASHES INTO YOUR EYES, RINSE THOROUGHLY WITH WATER AND CONSULT A DOCTOR.
- MAKE SURE NO BRAKE FLUID COMES INTO CONTACT WITH PAINTED PARTS SINCE BRAKE FLUID WILL CORRODE THE PAINTWORK!
- ONLY USE CLEAN, NEW BRAKE FLUID FROM TIGHTLY SEALED CONTAINERS.



### Changing rear brake fluid (50 SX, 50 Supermoto)

- Move the vehicle in a vertical position.
- Disassemble the cover ① together with the rubber boot ② from the brake fluid reservoir.
- Press the brake caliper pistons all the way back.
- Use a syringe to extract the used brake fluid and add fresh DOT 5.1 brake fluid (Motorex Brake Fluid DOT 5.1).



- Completely remove the bleeder screw ③ .
- Extract the old brake fluid from the system using the bleeder syringe 503.29.050.000. Always make sure that the brake fluid reservoir is filled with sufficient fresh brake fluid.
- Mount the bleeder screw ③ .



- Add DOT 5.1 brake fluid (Motorex Brake Fluid DOT 5.1) up to 15 mm under the top edge of the reservoir. Remount the rubber boot, cover and screws.
- Wash off any overflowing or spilled brake fluid with water.
- Actuate the foot brake lever until you feel the point of pressure.

### ! CAUTION !

- NEVER USE DOT 5 BRAKE FLUID. IT IS BASED ON SILICONE OIL AND DYED PURPLE. GASKETS AND BRAKE HOSES WILL BE DAMAGED IF DOT 5 BRAKE FLUID IS USED.
- BRAKE FLUID CAN CAUSE SKIN IRRITATIONS. AVOID COMING INTO CONTACT WITH THE SKIN OR EYES. IF BRAKE FLUID SPLASHES INTO YOUR EYES, RINSE THOROUGHLY WITH WATER AND CONSULT A DOCTOR.
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### Checking brake pads and brake disks

- See Owner's Manual



# REMOVING AND REFITTING ENGINE

# 3

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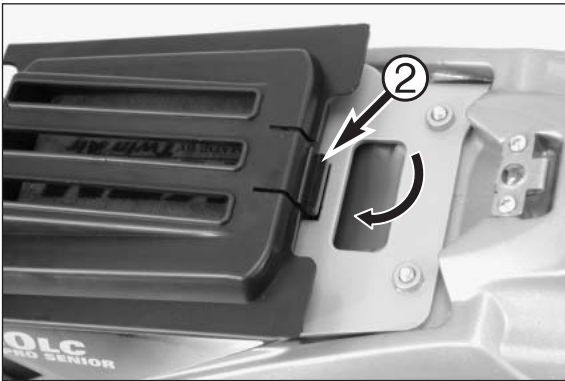


### Removing the engine

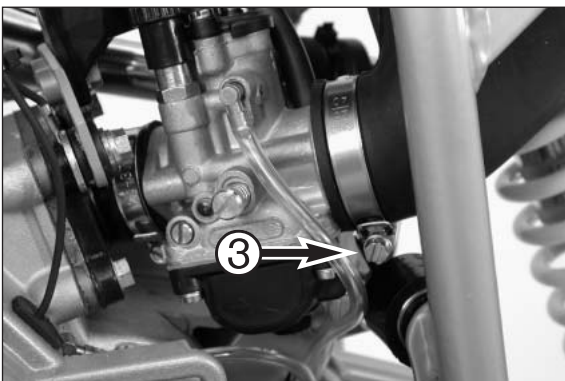
NOTE: the following steps are shown on a model with LC-engine, on a model with AC-engine a few works are not necessary like draining coolant liquid, removing and mounting the radiator and the radiator shield, bleeding the cooling system.

Clean the entire vehicle thoroughly before removing the engine.  
To avoid burns, allow the motorcycle to cool before starting to work.

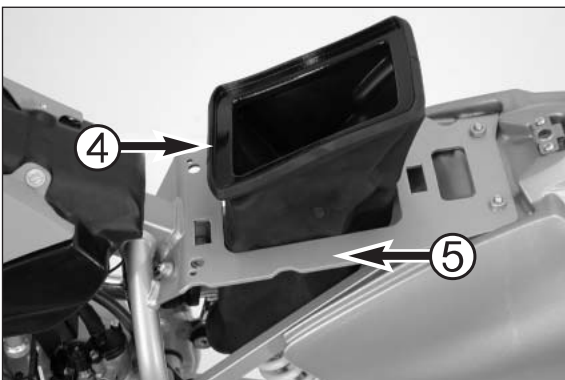
- Jack up the motorcycle on a sturdy work stand.
- Turn quick release ❶ on the seat 180°, lift back of seat slightly and pull back.



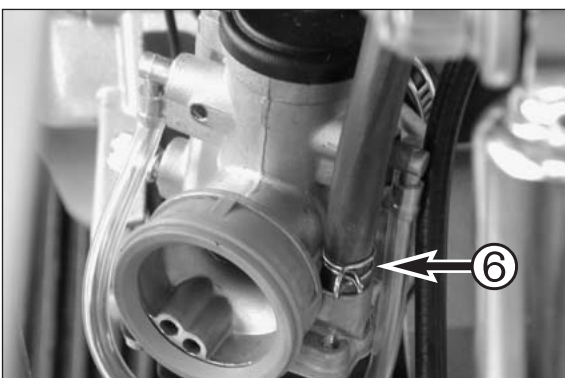
- Remove the cover of the air filter by reaching through the recess in the panel and pushing the locating tab 2 forwards with your finger.
- Remove air filter element.



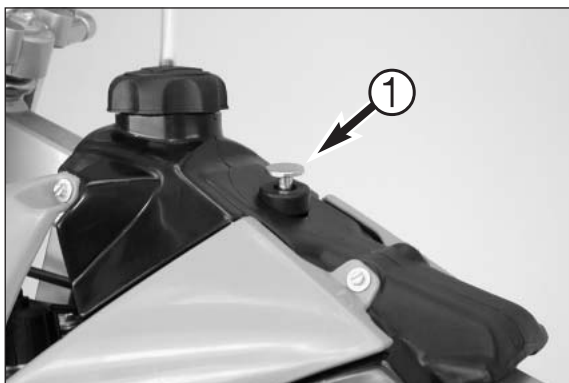
- Loosen hose clamp ❸ on the air filter box of the carburetor and remove air filter box.



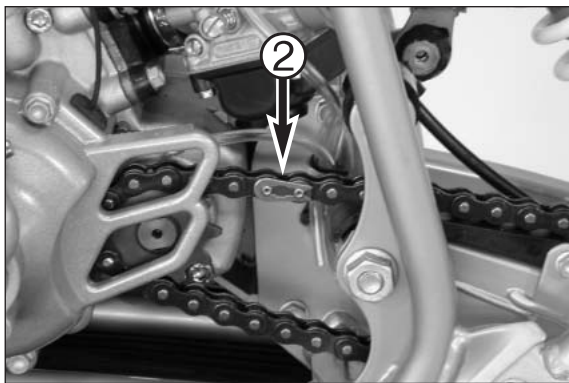
- Pull air filter box ❹ up through the retaining bracket ❺ by deforming it.



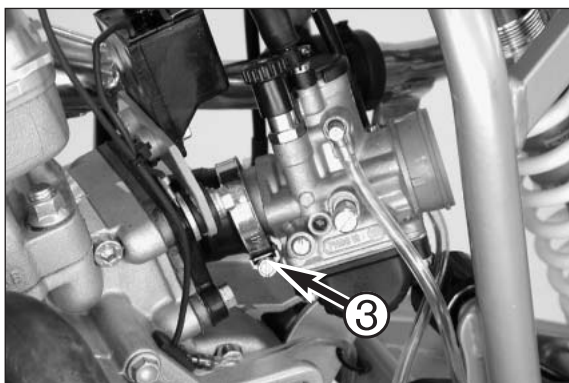
- Close fuel cock and disconnect fuel hose ❻ from the carburetor.



- Loosen retaining bolt on tank ① and remove from tank together with the rubber grommet.
- Lift tank from the frame.

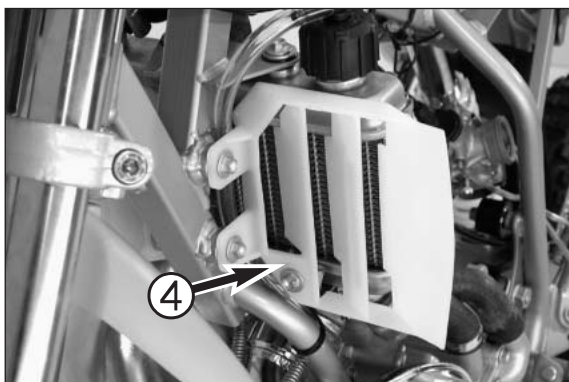


- Open chain joint ② and remove chain.

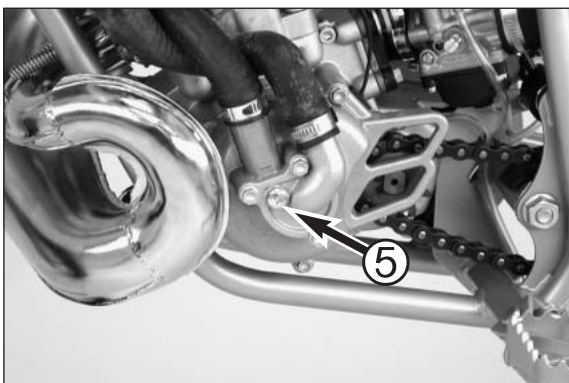


- Loosen hose clamp ③ of the intake flange on the carburetor, pull carburetor back and swing to the side.

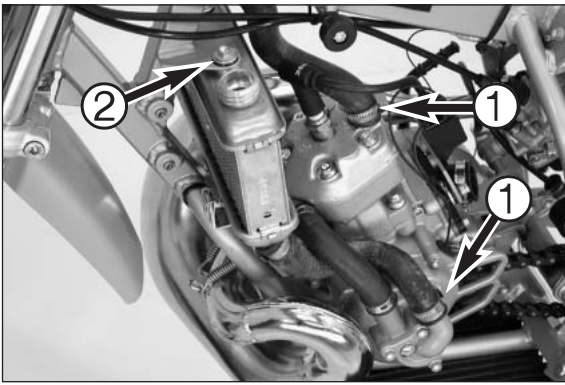
NOTE: if the carburetor is not being serviced, it does not need to be removed - the carburetor openings should however be covered with a clean cloth and the gasoline drained from the float chamber.



- Remove radiator shield on the right and left ④.



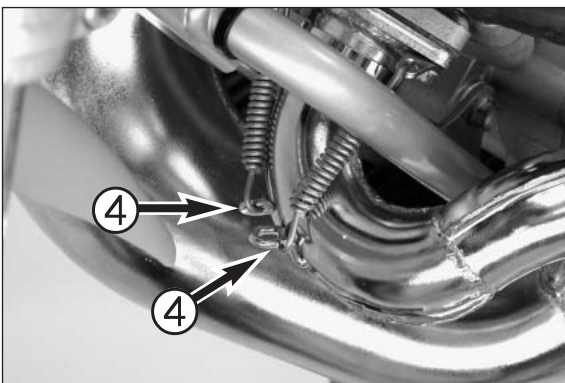
- Unbolt radiator cap, open drain plug ⑤ and allow cooling fluid to drain into a receptacle. Then remount the drain plug with a new sealing ring and tighten (5 Nm/4 ft.lb).



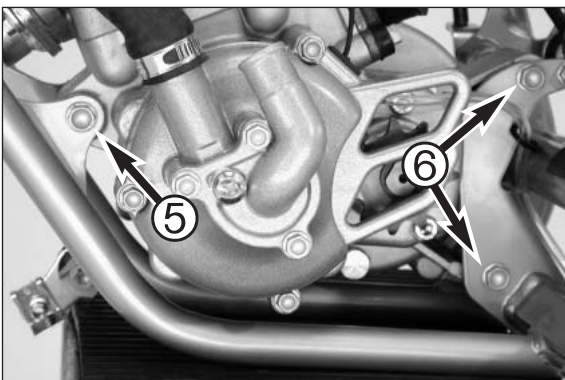
- Loosen hose clamp ① and pull both hoses from their connections.
- Unbolt radiator retaining bolt ② and laterally remove radiator with water hoses from the frame.



- Carefully pull socket connector ③ apart.



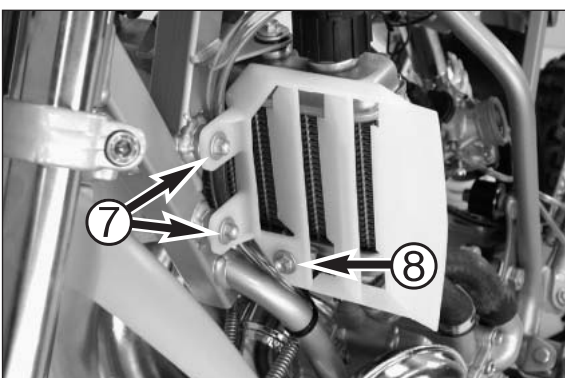
- Detach both exhaust springs ④ with a suitable wrench, remove springs.
- Unbolt the exhaust bracket on the right and pull exhaust off towards the front.



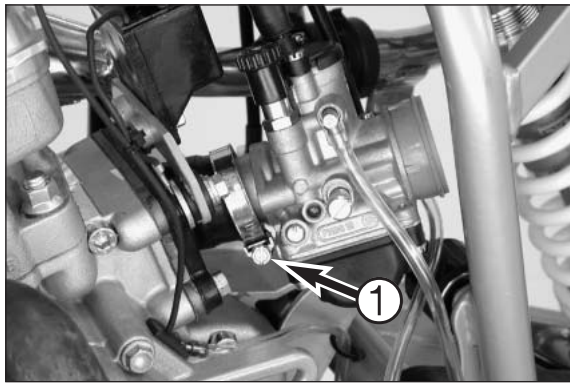
- Loosen engine mounting bolts ⑤ and ⑥, lift engine from the frame.

### Installing the engine

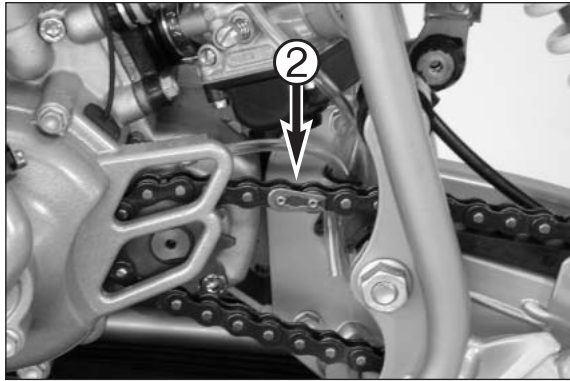
- Lift engine into the frame and fasten with bolt ⑤ (M8x65 with nut) and 2 bolts ⑥ (M8x55).
- Tighten bolts to 30 Nm (22 ft.lb).
- Mount exhaust, insert springs ④ and tighten bolt for exhaust bracket M6x15 on the right.
- Carefully connect socket connector ③.
- Position radiator in the frame and tighten the radiator retaining bolts ② (M6x10 with washer 18/6,5/1,5) to 10 Nm (7 ft.lb). Connect hoses and tighten hose clamps ①.
- Fill cooling liquid (total filling amount approx. 0,5 liter).
- Mount radiator shield on the right and left.



NOTE: bolts ⑦ (M6x10) are bolted onto the side of the frame, bolt ⑧ (M6x15) is bolted into the radiator bracket.

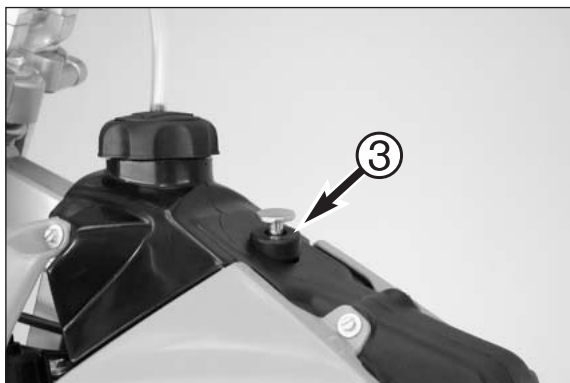


- Install carburetor on the intake flange and tighten hose clamp ❶.

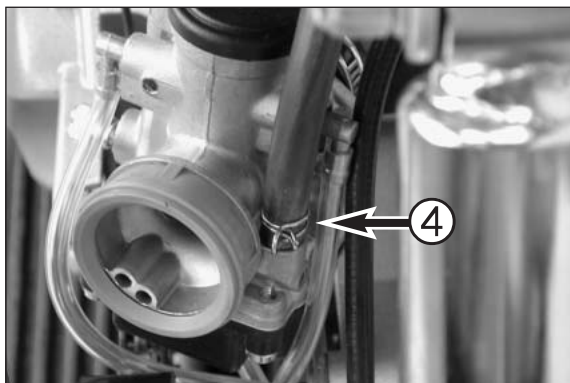


- Place chain on rear sprocket and pinion, mount chain joint ❷ and secure.

NOTE: make sure the locking member runs in the right direction (see photo). The closed side of the safety device must point in the running direction.



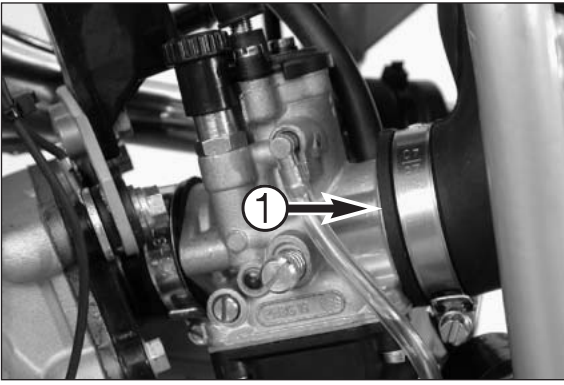
- Mount tank and bolt tight. Do not forget the rubber grommet ❸ for the bolt.



- Connect fuel hose ❹ to the carburetor and secure.



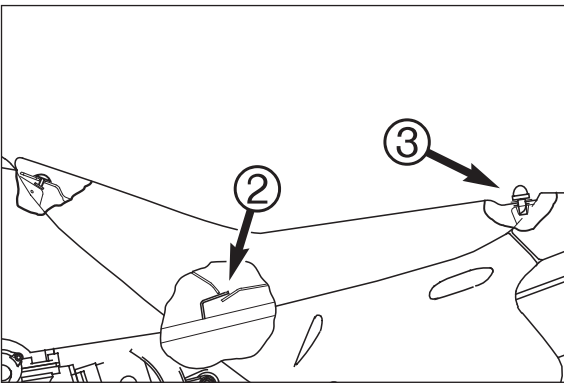
- Slide air filter box into the frame bracket.



- Attach connection **1** of the air filter box to the carburetor and tighten hose clamp.



- Insert air filter element in the air filter box and mount cover.
- NOTE: the locating tabs in the cover must engage in the panel.



- Mount seat. Make sure the retaining bracket **2** is inserted properly. Insert quick release **3** in the dolly and turn 180°.

After installing the engine, perform a short test run and correct the cooling fluid level (LC-engine). Then take the motorcycle on a road test. After the road test, check the engine, the fuel system and the exhaust system for tightness.



# DISASSEMBLING THE ENGINE

# 4

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<b>DISMOUNTING CLUTCH AND PRIMARY DRIVE</b> .....	<b>.4-6</b>





## SPECIAL TOOLS ENGINE 50 AC/LC

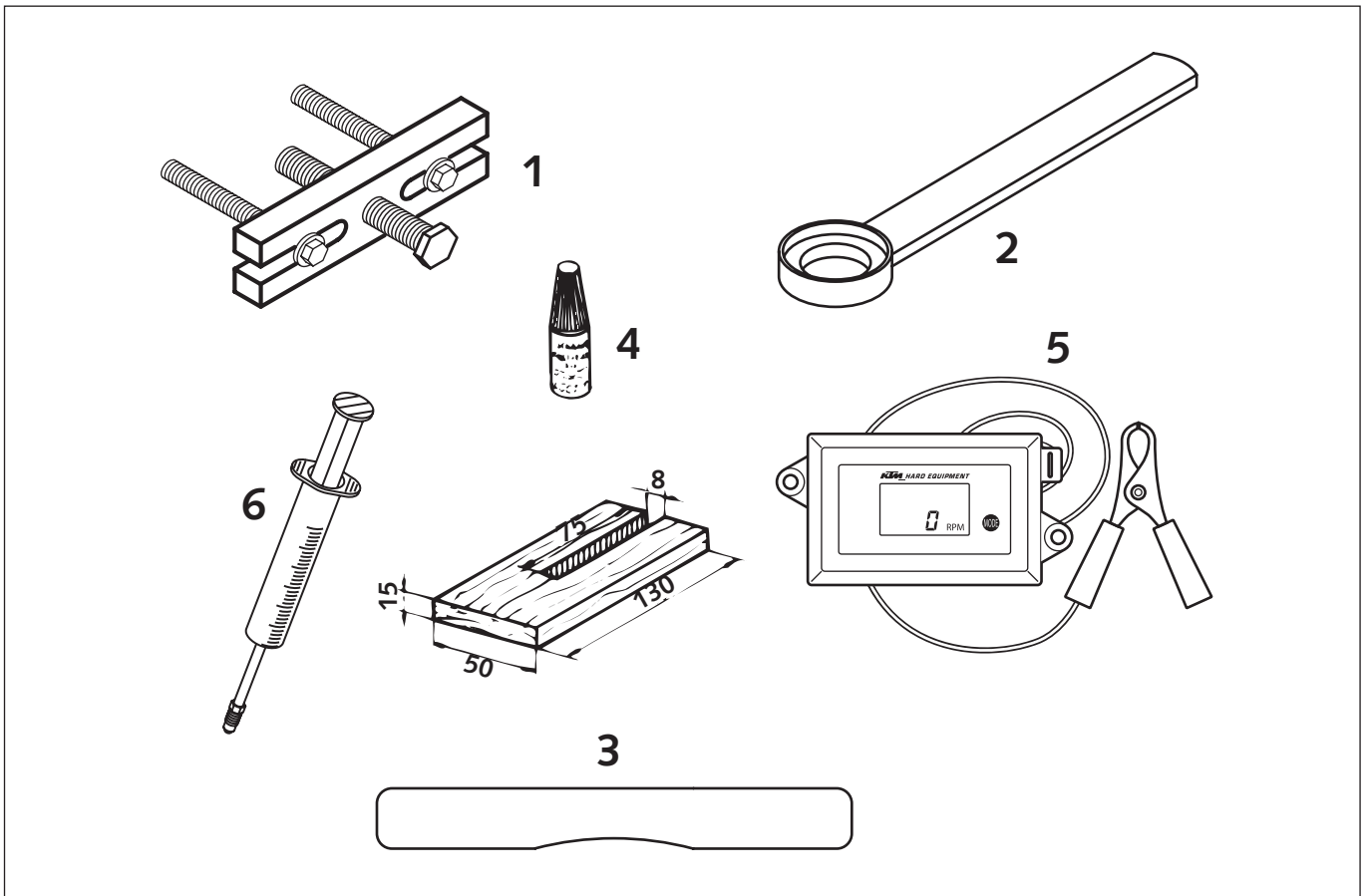
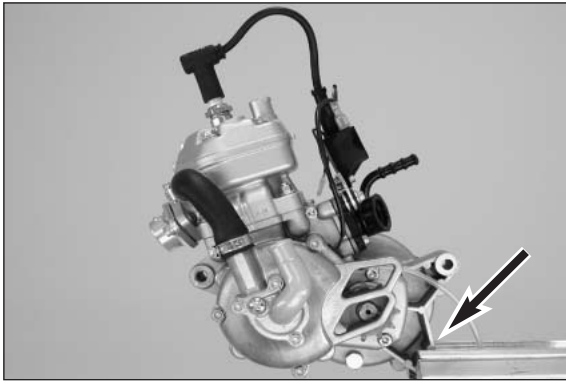
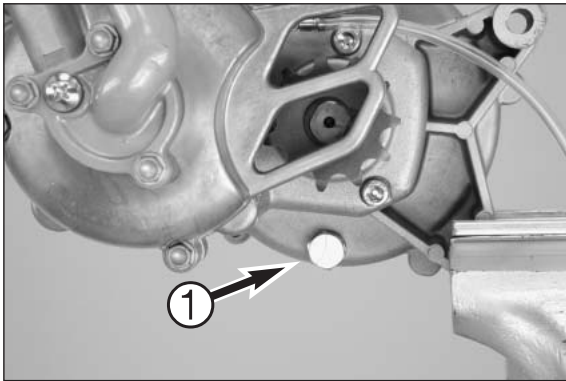


FIG	PARTNUMBER	DESCRIPTION
1	590.29.021.000	Puller for flywheel
2	451.12.021.000	Rotor holding tool
3	451.29.006.000	Adjusting plate for Dimension „X“
4	6 899 785	Loctite 243 blue
5	451.29.075.000	Tachometer
6	503.29.050.000	Bleeding syringe



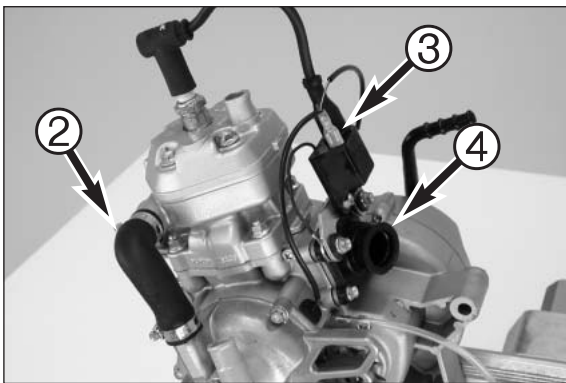
### Clamp the engine using a vice

- Clean the engine thoroughly prior to disassembling.
- The engine can be clamped with a vice, using a protective pad to clamp the lower rear bracket (see photo).



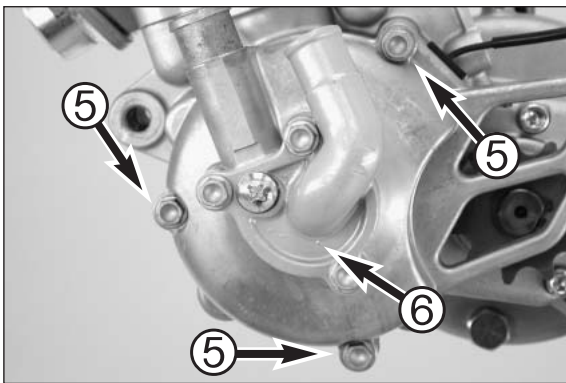
### Drain the transmission oil

- Remove the transmission oil drain plug ① including the sealing ring and allow transmission oil to drain.
- Mount the transmission oil drain plug with new sealing ring and tighten to 15 Nm (11 ft.lb).



### Remove water hose, intake flange and ignition coil

- Loosen hose clamps and remove water hose ② (only LC-engine).
- Pull plug ③ from the ignition coil, disconnect spark plug cap from the spark plug.
- Loosen 4 bolts on the intake flange ④. Remove the ignition coil with bracket, intake flange and reed valve housing.
- Remove spark plug.

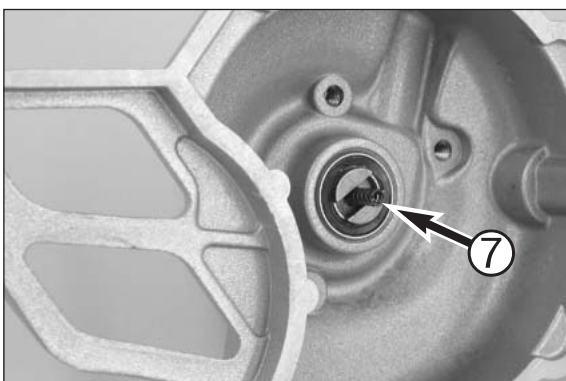


### Remove ignition cover and pump.

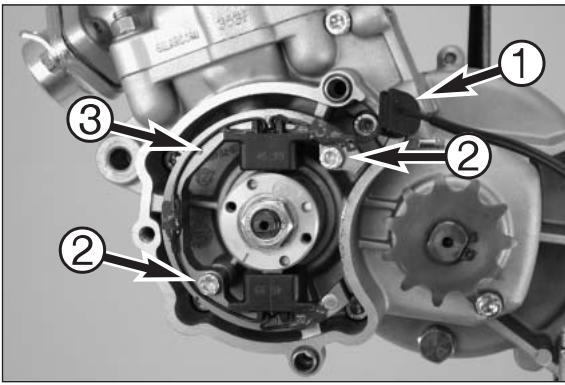
- Loosen bolt ⑤ and remove ignition cover.

#### NOTE:

- The water pump ⑥ is located on the ignition cover of the LC-engine.
- The ignition cover is centered with 2 dowels. They usually stay in the engine case and should be removed with a suitable wrench.

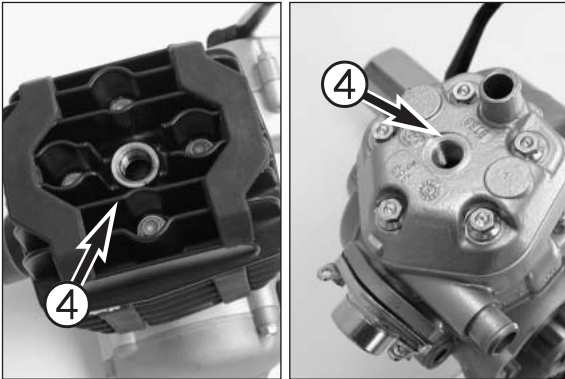


NOTE: water pump shafts from the 2004 model have a hole containing a spring ⑦.



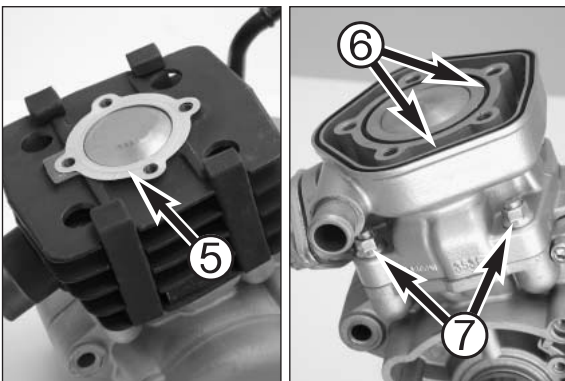
### Remove ignition stator.

- Pull cable guide **1** from the case.
- Remove allen bolts **2** of the ignition stator **3**.
- Carefully pull stator **3** out of the case.

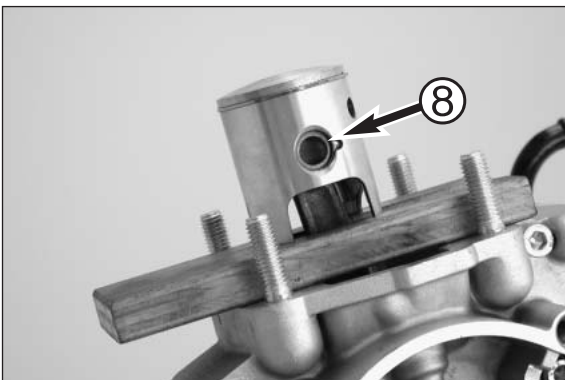


### Remove cylinder head, cylinder and pistons.

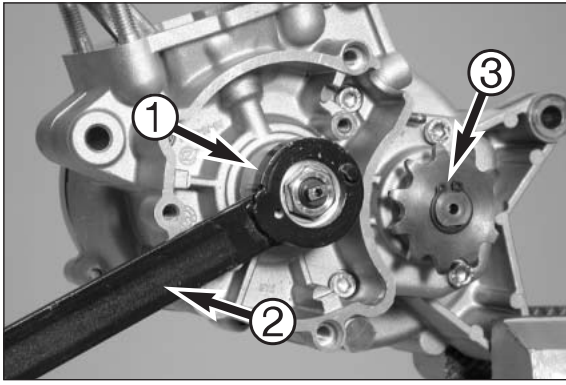
- Loosen bolts on cylinder head crosswise and remove.
- Discard washers (LC-engine), remove cylinder head **4**.



- Remove gasket **5** (AC-engine) or O-rings **6** (LC-engine) from cylinder and discard.
- Loosen 4 bolts **7** on the cylinder base crosswise and remove; carefully lift the cylinder off.



- Place pistons on a self-made mounting board.
- Remove ring lock **8** from the piston pin using a suitable tool.
- Push piston pins out of the piston by hand, remove pistons and pull needle bearing from the conrod.
- Remove cylinder base gasket.



### Pull off ignition rotor

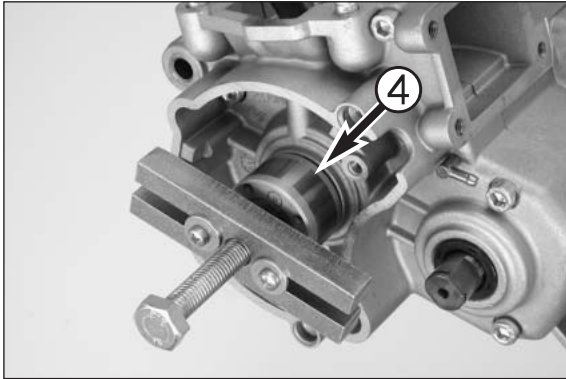
- Hold ignition rotor ① with special tool ②, open the nut and remove.

NOTE: a washer is located under the nut; the magnetic attraction of the rotor causes it to adhere to the rotor.

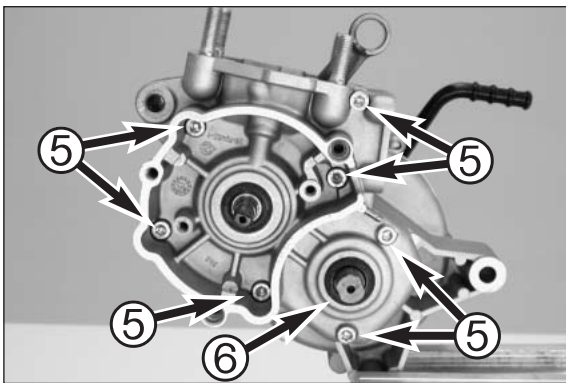
**! CAUTION !**

MAKE SURE THE TWO PINS OF THE SPECIAL TOOL DO NOT CATCH THE THREADED HOLES, OTHERWISE THE THREADING WILL BE DAMAGED AND THE ROTOR CAN NO LONGER BE REMOVED.

- Remove circlip ③ from the chain sprocket and remove chain sprocket.

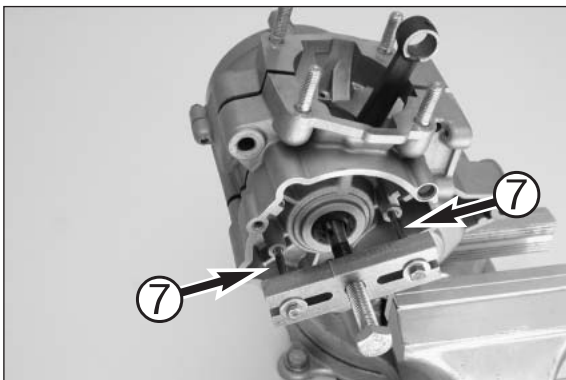


- Bolt extractor to the rotor with 2 M4x35 bolts, hold extractor in place and pull rotor ④ off by bolting in the extractor bolt.
- Remove woodruff key from the groove.



### Split the casing halves

- Loosen all 7 allan bolts ⑤ holding the two casing halves together and set aside.



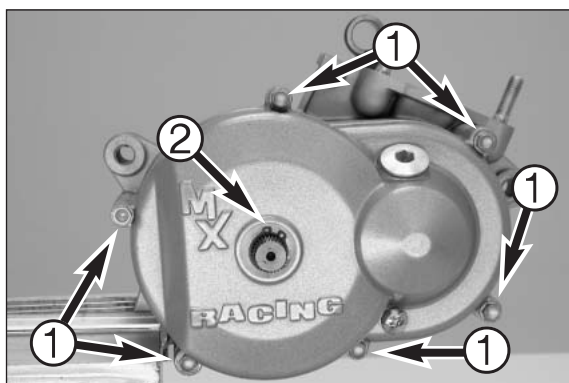
- Bolt extractor to the casing with 2 M5x50 bolts ⑦.
- Hold extractor in place and separate the casing by bolting in the extractor bolt, gently tapping the casing with a plastic hammer to prevent the bearing on the drive shaft ⑥ from canting.

**! CAUTION !**

IF THE BEARING ON THE DRIVE SHAFT CANTS, STOP PULLING OFF THE CASING. USE THE PLASTIC HAMMER TO CAREFULLY CORRECT THE DISTORTION, OTHERWISE THE CASING WILL BE DAMAGED.

- Remove casing; remove seal and discard.

NOTE: the housing halves are centered with 2 dowels which should also be removed.



### Disassemble the clutch and primary drive

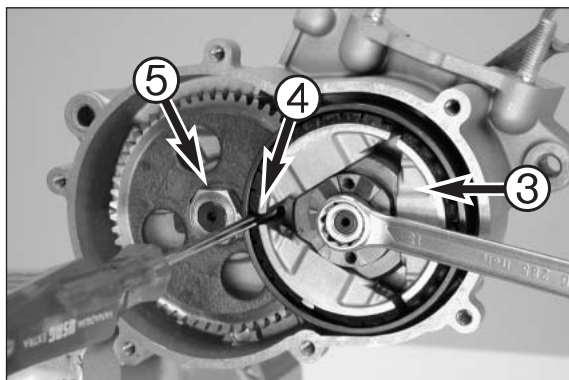
- Recheck the engine to provide access to the clutch side.
- Remove kickstarter and bolts **1** on the clutch cover.
- Remove clutch cover, discarding the seal.



#### WARNING



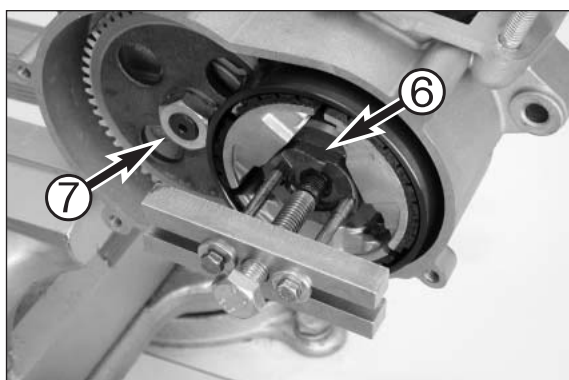
DO NOT REMOVE THE CIRCLIP **2**, OTHERWISE THE KICKSTARTER SPINDLE MAY FALL FROM THE CASING AND THE KICKSTARTER SPRING CAUSE INJURIES.



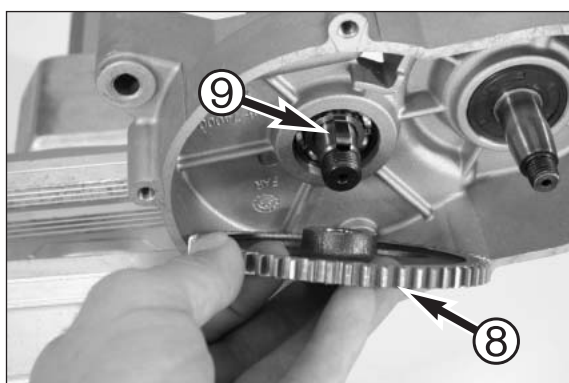
- Block the centrifugal clutch **3** with a suitable mandrel **4**.

NOTE: the drum and the gear wheel of the primary drive have holes. Push the mandrel through both holes.

- Bend up the lock washer **5** on the output shaft nut.
- Loosen the nut on the clutch and the output shaft and pull the mandrel out.



- Remove nut and washer from the crankshaft.
- Bolt the extractor to the hub of centrifugal clutch **6** using bolts M5x50, hold the extractor in place and pull the centrifugal clutch from the crankshaft by bolting in the extractor bolt.
- Remove the centrifugal clutch from the crankshaft together with the bearing and spacing washers.
- Remove nut **7** and lock washer from the output shaft.



- Remove gear **8** on the primary drive from the shaft, remove woodruff key **9** from the shaft groove.
- Press the crankshaft and output shaft out of the casing using a press or suitable extractor.



#### CAUTION



THE TWO SHAFTS MAY NOT BE STRUCK OUT OF THE CASING WITH A HAMMER SINCE THE CRANKSHAFT OR THE CASING MAY BE DAMAGED.



# SERVICING INDIVIDUAL COMPONENTS

# 5

## INDEX

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Art.-Nr. 3.206.028-E

Repair manual KTM MINI 50 air/liquid cooled

### Engine housing

Note: Read through the following section before commencing work. Then determine the assembly sequence so that the engine housing halves only need to be heated up once before replacing the bearings.

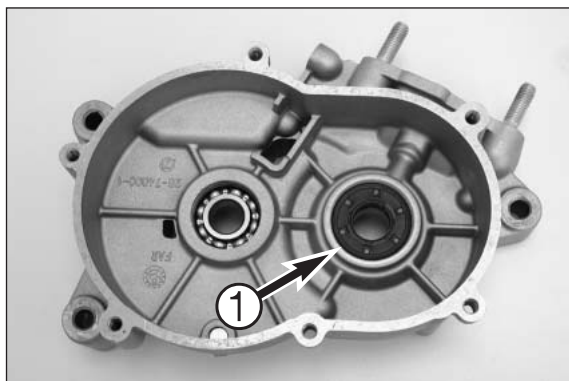
Having first removed the dowels, in order to expel the bearings or remove them with light mallet blows, the housing halves must be placed on a suitably large plane surface, supporting the whole of the sealing surface without damaging it. A wooden panel is best used as a base.

Bearings or shaft seal rings should not be hammered into their seats. If no suitable press is available, use a suitable mandrel and hammer them in with great care. Cold bearings will practically drop into their seats at an engine housing temperature of approx. 150° C.

After cooling, should the bearings fail to lock in the bore, they are bound to rotate after warming. In that event the housing must be replaced.







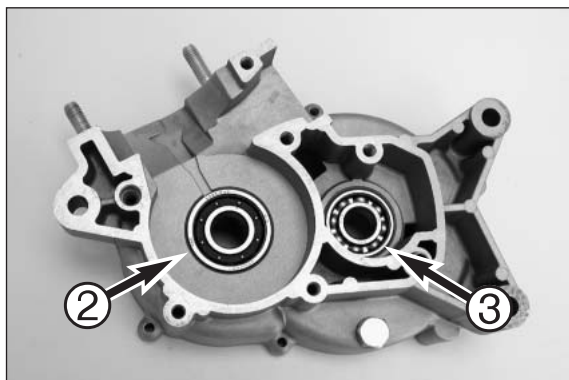
### Working on the right half of the engine case

Remove shaft sealing ring ❶ and heat the engine case half on a heating plate to approx. 150° C.

NOTE: if the engine case is heated to 150° C and struck on a wooden surface, the bearings usually fall out of the bearing seats automatically. If necessary, the bearings must be pushed out.

#### ! CAUTION !

- ALWAYS REMOVE DOWELS FIRST TO PREVENT THE CASE FROM BEING DAMAGED.
- THE DEVICES (MANDRELS) TO PRESS THE NEW BEARINGS IN PLACE SHOULD BE DESIGNED SUCH THAT THEY ONLY REST ON THE OUTER RING OF THE BEARING, OTHERWISE THE BEARINGS WILL BE DAMAGED WHEN FITTED.



### Grooved ball bearing for crankshaft ❷

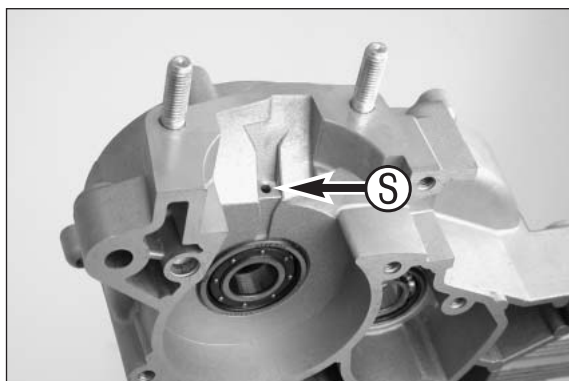
Use a suitable mandrel to press the grooved ball bearing into place. Press the new grooved ball bearing all the way in.

NOTE: the grooved ball bearing of the crankshaft will protrude approx. 1 mm from the surface of the case.

### Grooved ball bearing for output shaft ❸

Use a suitable mandrel to press the grooved ball bearing into place. Press the new grooved ball bearing all the way in.

NOTE: the grooved ball bearing of the output shaft should fit flush with the surface of the case.



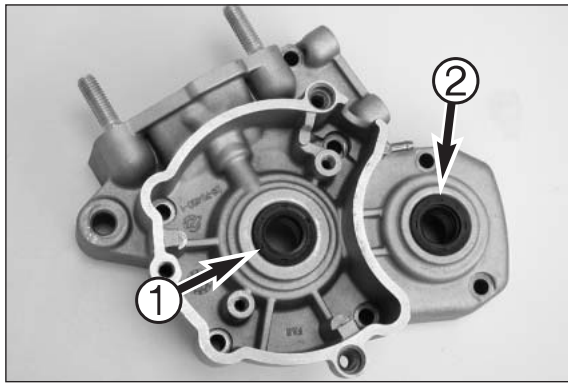
### Shaft sealing ring for crankshaft ❹

Press a new shaft sealing ring into place with the sealing lip to the inner side.

NOTE: the seal shaft ring will fit approx. 1 mm lower than the surface of the case.

After the engine case halves have cooled, check all bearings for firm retention in the bearing seats.

Finally, check the greasing hole ❺ for the grooved ball bearing of the crankshaft and the connection for the gearbox ventilation for clearance.



### Working on the left half of the engine case

Remove shaft sealing rings ①/② and heat engine case halves on a heating plate to approx. 150° C.

#### NOTE:

- If the engine case is heated to 150° C and struck on a wooden surface, the bearings usually fall out of the bearing seats automatically. If necessary, the bearings must be pushed out.
- The devices (mandrels) to press the new bearings in place should be designed such that they only rest on the outer ring of the bearing, otherwise the bearings will be damaged when fitted.

#### Grooved ball bearing for crankshaft ③

Use a suitable mandrel to press the grooved ball bearing into place. Press the new grooved ball bearing all the way in.

NOTE: the grooved ball bearing of the crankshaft will protrude approx. 1 mm from the surface of the case.

#### Grooved ball bearing for output shaft ④

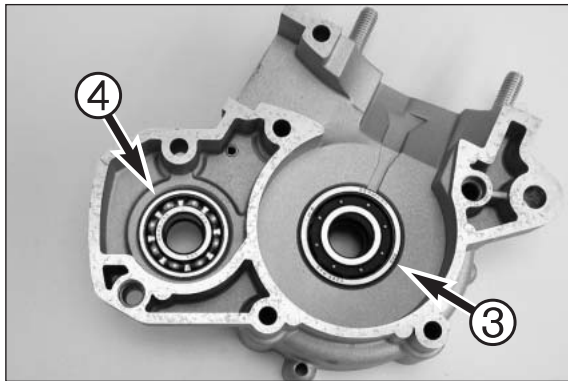
Use a suitable mandrel to press the grooved ball bearing into place. Press the new grooved ball bearing all the way in.

NOTE: the grooved ball bearing of the output shaft should fit flush with the surface of the case.

#### Shaft sealing ring for crankshaft ①

Press a new shaft sealing ring into place with the sealing lip to the inner side.

After the engine case halves have cooled, check bearings for firm retention.

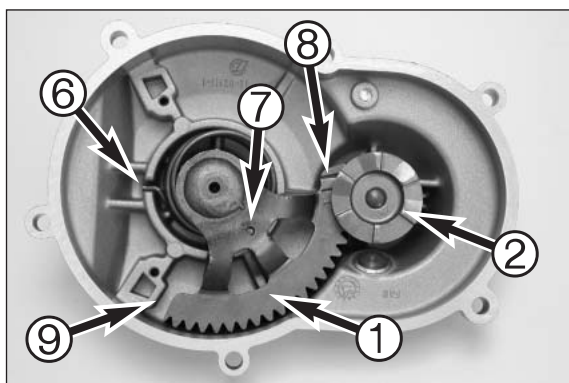


### Measure the crankshaft

If continuing to use the crankshaft, check crankshaft journal for lateral runout.

The lateral runout of the crankshaft journal should be no more than 0.05 mm

NOTE: Conrod bearing and crankshaft can only be checked in dismantled condition, this should be done in a special workshop.



### Working on the clutch cover

NOTE: dismantling the clutch cover is necessary if parts are damaged or the O-ring is leaking.

- Turn kickstarter shaft **1** counter-clockwise and remove ratchet gear **2**. Check gearing for wear.

NOTE: If the kickstarter shaft is to be removed, the outer circlip must be removed, carefully pulling the kickstarter shaft out of the cover.



### WARNING



THE KICKSTARTER SPRING IS PRETENSIONED. IT MUST BE STRESS-RELIEVED WHEN THE KICKSTARTER SHAFT IS PULLED OUT.

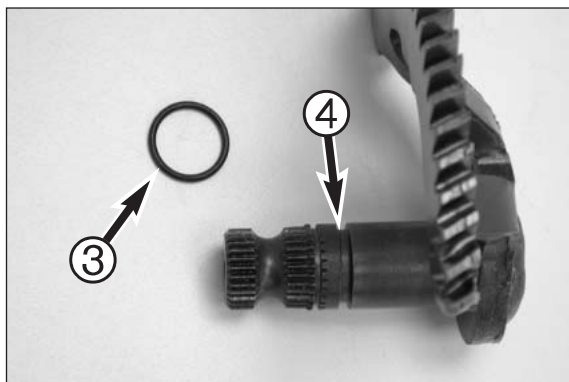
- Clean kickstarter shaft and renew O-ring **3** (up to the 2003 model).

NOTE:

- make shure that the O-ring is mounted in the second groove **4**.
- starting with the 2004 model, a shaft seal ring **5** is installed in the engine instead of an O-ring and the kickstarter shaft no longer has a second groove. Pry out the old shaft seal ring and press the new shaft seal ring in until flush with a suitable tool.

During assembly only push the kickstarter shaft into the clutch cover far enough to be able to reinsert the spring (**6** and **7**). The spring is pretensioned by turning the kickstarter shaft in a counter-clockwise direction, then completely push the kickstarter shaft into the clutch cover. Hold the kickstarter shaft turned, mount the ratchet gear and release the kickstarter shaft again.

NOTE: the end of the kickstarter shaft gearing has a deformation **8** to prevent the kickstarter shaft from hitting against the clutch cover, causing it to wedge with the gearing of the ratchet gear. Make sure to keep a gap between the kickstarter shaft and stop **9**.



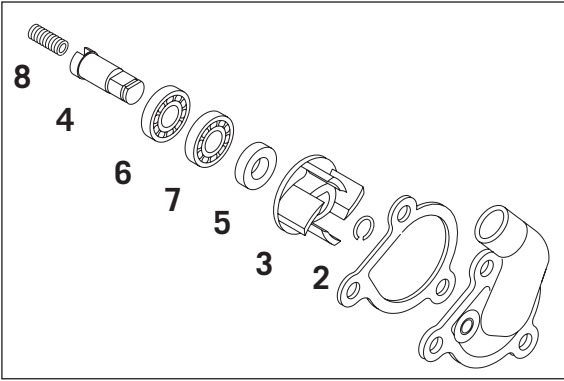
**Overhaul the water pump (LC-engine)**

- Remove cover ①, discard the O-rings.

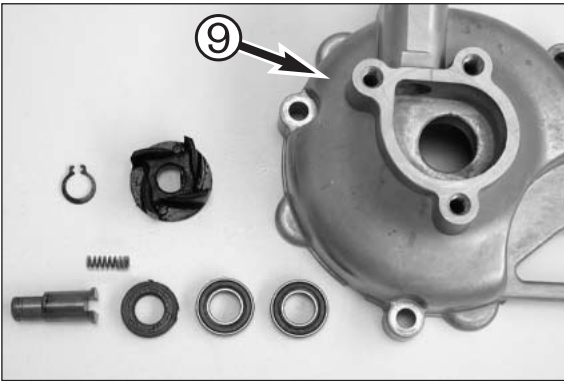


- Remove circlip ② with a suitable wrench.
- Remove the water pump wheel ③ from the pump shaft ④.
- Press out shaft ④, press out both bearings (⑥ and ⑦).
- Remove seal shaft ring ⑤.

NOTE: a spring ⑧ is installed starting with the 2004 model. Remove before disassembling.



- Press in a new seal shaft ring ⑤, make shure that the open side of the seal shaft ring is located on the side of the water pump wheel.
- Slide both new bearings (⑥ and ⑦) onto the pump shaft ④.
- Lightly grease pump shaft and press the pump shaft with the bearings in all the way into the ignition cover ⑨, check for smooth operation.
- Mount the water pump wheel and the circlip.
- Mount cover 1 with a new O-ring.
- Mount the spring ⑧ (applies to models from 2004), fix in the hole with a small amount of grease, if necessary.

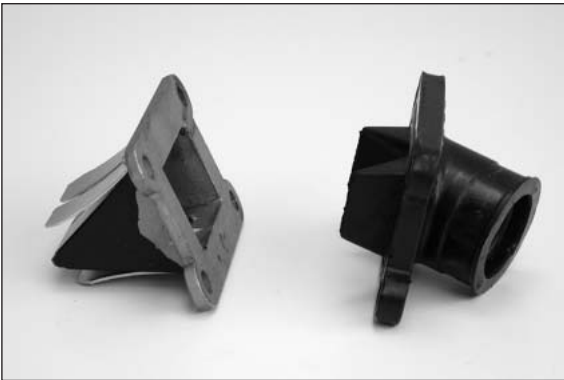
**Reed valve housing, intake flange**

NOTE: the reed paddles gradually lose their tension, leading to power loss. Defective or worn reed paddles must be replaced. If the sealing surfaces of the reed valve housing are also damaged, replace the entire reed valve housing.

**! CAUTION !**

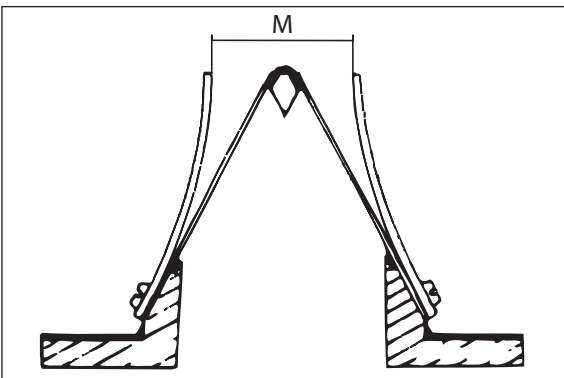
SECURE ALL BOLTS OF THE DIAPHRAGM HOUSING WITH LOCTITE 243 AFTER ASSEMBLY.

Intake flange  
Check for cracks and other damage.



Reed valve housing  
Measure the distance **M** between the stop plates with a sliding gauge. If the measured value deviates from the desired value, the stop plates must be bent accordingly.

Distance **M** = 17 mm

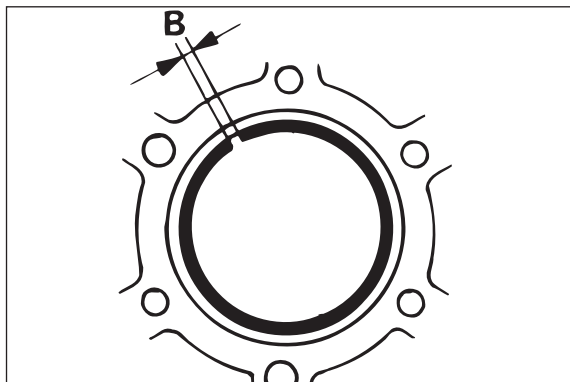




## Check pistons

If continuing to use a used piston, check as follows:

1. Check piston bearing surface for pressure marks, piston seizure (light friction can be removed with a fine emery stone).
2. The piston ring may not jam in the piston ring groove. To clean the piston ring groove, use an old piston ring or sanding paper (400 grain size).
3. Piston ring anti-rotation device must fit tightly in the piston and may not be worn.
4. Check piston ring for wear and gaps in the cylinder.



## Measuring the piston ring end gap

- Insert the piston ring in the cylinder and align with the piston (approx. 10 mm / 0.39 in under the upper edge of the cylinder).
- Measure end gap **B** with a feeler gauge.

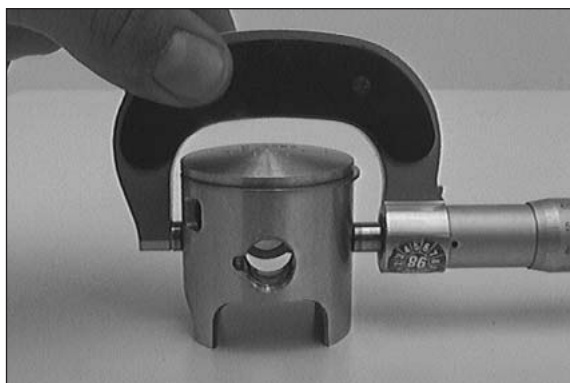
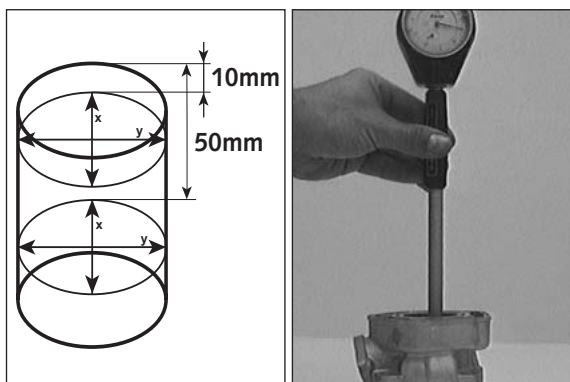
End gap: max. 0.20 mm / 0.0078 in

NOTE: If the end gap is larger than specified above, pistons and cylinder must be checked for wear. If the piston wear and cylinder wear are within the tolerance zone, the piston ring must be replaced.

## Measure the piston and cylinder, determine the piston

- To determine cylinder wear, measure the cylinder 10 mm and 50 mm from the top using a micrometer (shown in the drawing).
- Measure the cylinder diameter in the X and the Y axis to establish any ovality.
- The piston is measured at the piston skirt, transverse to the piston pin 32 mm below the top, as shown in the illustration.
- The smallest cylinder diameter minus the largest piston diameter determines the piston fitting clearance.

Piston fitting clearance	AC-engine:	0.055 - 0.065 mm (0.00216 - 0.00256 in)
	LC-engine:	0.045 - 0.055 mm (0.00177 - 0.00216 in)



MARK	PISTON	CYLINDER AC	CYLINDER LC
A	39.455 - 39.460 mm	39.515 - 39.520 mm	39.505 - 39.510 mm
	1.5533 - 1.5535 in	1.5557 - 1.5559 in	1.5553 - 1.5555 in
B	39.461 - 39.465 mm	39.521 - 39.525 mm	39.511 - 39.515 mm
	1.5535 - 1.5537 in	1.5559 - 1.5561 in	1.5555 - 1.5557 in
C	39.466 - 39.470 mm	39.526 - 39.530 mm	39.516 - 39.520 mm
	1.5537 - 1.5539 in	1.5561 - 1.5563 in	1.5557 - 1.5559 in
D	39.471 - 39.475 mm	39.531 - 39.535 mm	39.521 - 39.525 mm
	1.5539 - 1.5541 in	1.5563 - 1.5565 in	1.5559 - 1.5561 in

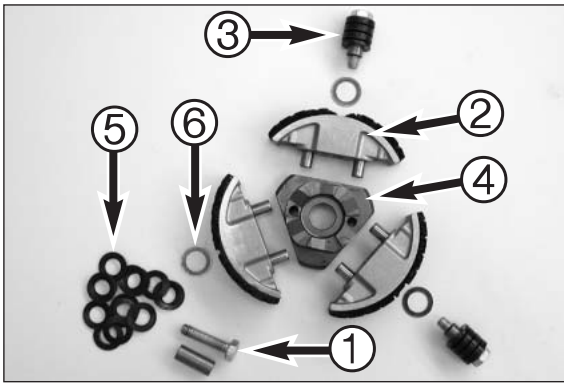
## NOTE:

When replacing piston and cylinder always make sure to use a piston and cylinder of the same type. The type identification mark (A to D) can be found on the cylinder base or the piston head, respectively.

The table to the right indicates the tolerance thresholds for the listed components.

Always keep in mind that a minimum piston fitting clearance of 0.055 mm (0.00216 in) (AC-engine) or 0.045 mm (0.00117 in) (LC-engine) is required.





### Overhauling the centrifugal clutch

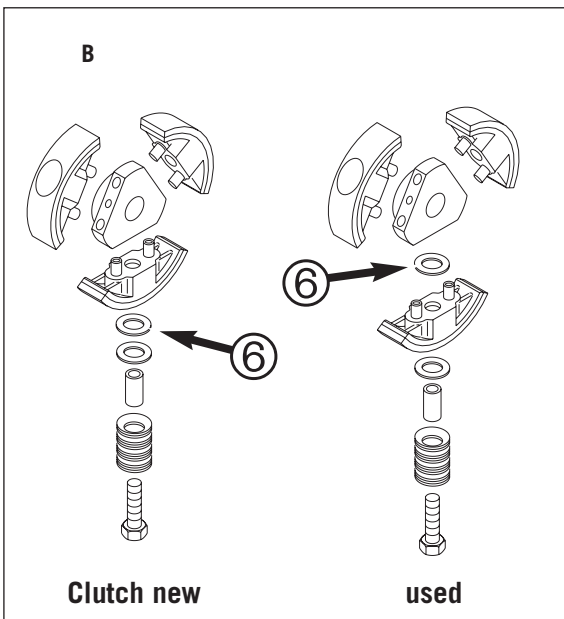
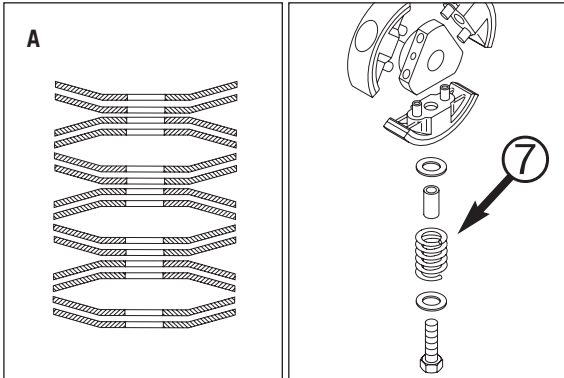
- Loosen HH bolts ① on the clutch shoes ② and remove together with the set of springs ③ from the clutch hub ④.

NOTE: coilsprings ⑦ are used instead of the spring washers for the AC-engine. Length of clutch springs: min. 19.6 mm (0.748 in).

- Remove HH bolts with sleeves and set of springs from the clutch shoes.

NOTE:

- the set of springs consists of 14 spring washers ⑤, make sure the spring washers are placed exactly in the same order ④ shown below (only LC-engine).
- Washers ⑥ to pretension the spring sets are located between the spring sets and the clutch shoes. The preload on the spring set has an influence on the clutch engagement speed. 0.5 mm more preload increases the clutch speed by approx. 500 rpm.
- the clutch speed is the speed at which the clutch begins to engage and the motorcycle begins to move.
- check the clutch speed with the tachometer 451.29.075.000 and adjust if necessary:  
AC-engine: 4000 - 4500 rpm  
LC-engine: 8500 - 9000 rpm



### Balancing the clutch wear

- Check clutch shoes for wear; if the lining only shows minor signs of wear, the linings can be reinstalled.

NOTE:

- the centrifugal clutch has an outer diameter of approx. 82.5 mm (3.248 in) when new.
- to compensate for minor wear in the lining, one of the preload washers ⑥ from any set of springs can be inserted between the clutch hub and clutch shoes - see Fig. ⑥. If only one washer is installed, this washer can be used.
- the inner diameter of the clutch drum must not exceed 84.4 mm (3.3228 in) (new condition 84.0 mm [3.3071 in]).
- Make sure the spring sets are kept free of contamination during maintenance and repair work to the clutch, otherwise they may malfunction.

Assembly is in the reverse order as disassembly. HH bolts ① must be secured with Loctite 243 and tightened to 12 Nm (9 ft.lb).

# ASSEMBLING THE ENGINE

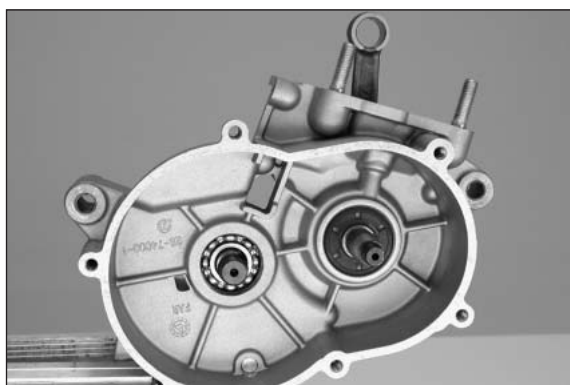
# 6

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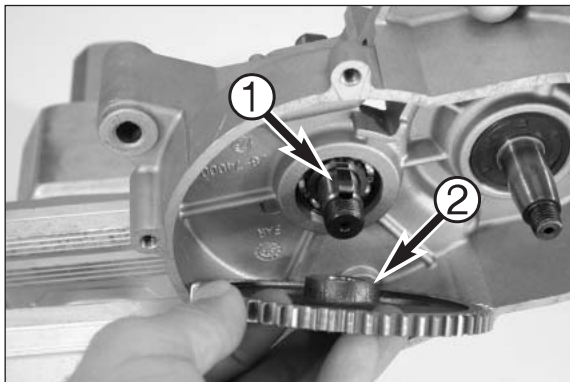
### Mounting the crankshaft and output shaft

- Heat the engine case on a heating plate.
- Lubricate both bearings, lightly grease the seal shaft ring.
- Push the output shaft and crankshaft into the bearing.

NOTE: the conrod must be in a vertical position.

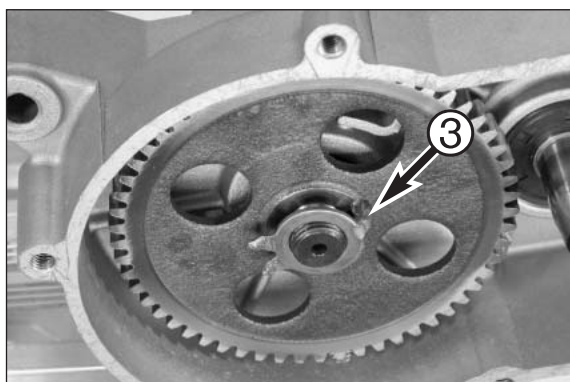
**! CAUTION !**

Do NOT INSERT THE SHAFTS INTO THE BEARINGS WITH A HAMMER SINCE THE BEARINGS AND CRANKSHAFT MAY BE DAMAGED.



### Mounting primary drive

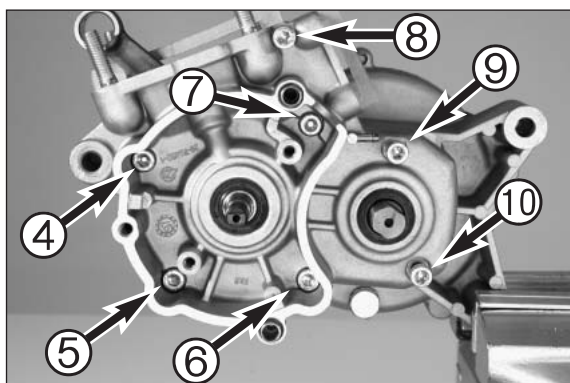
- Insert woodruff key ① in the output shaft groove.
- Place the gear of the primary drive on the output shaft, collar ② first.



- Slide on the nut lock washer.

NOTE: the tab of the lock washer ③ must engage in the bore of the primary drive wheel.

- Bolt nut M14x1,25 into place.



### Mounting the left half of the case

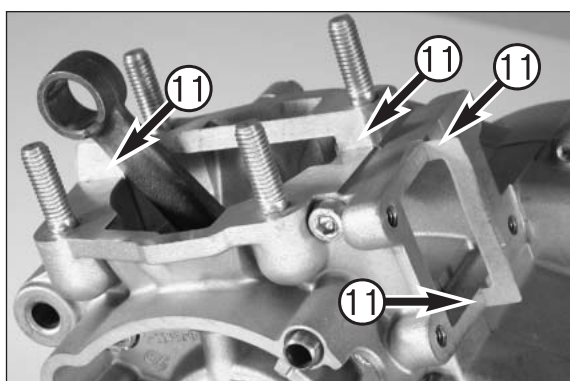
- Mount 2 dowels 7x9x10, apply new seal.

NOTE: the seal is not cut until after the second half of the case is mounted.

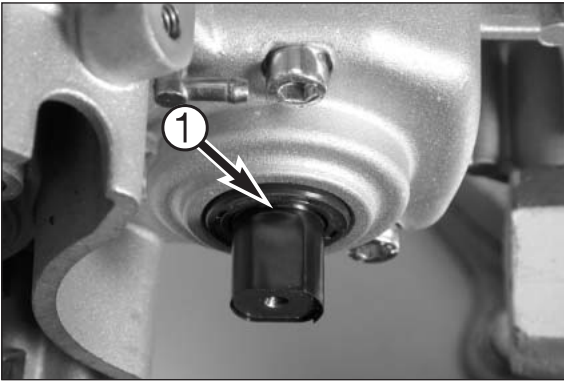
- Heat the left half of the case on a heating plate and mount.
- Bolt 7 allen bolts into place.

NOTE: ④, ⑧ and ⑩ are M6x40; ⑤, ⑥, ⑦ and ⑨ are M6x35 bolts.

- Tighten ④ to ⑦ crosswise to 10 Nm (7 ft.lb).
- Tighten ⑧ to ⑩ to 10 Nm (7 ft.lb).
- Gently tap the case with a plastic hammer a few times near the bearings to relieve the pretensioning.
- Check both shafts for smooth operation by turning.



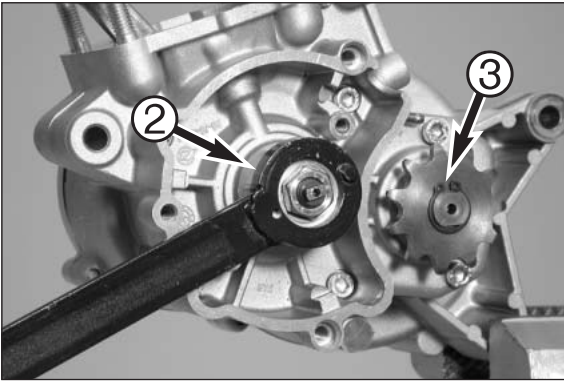
- Cut protruding seal ⑪ with a sharp knife for a flush fit.



- Wrap insulating tape around the output shaft in the area of the sharp edge ① to prevent the seal shaft ring from being damaged.

NOTE: wrap insulating tape just above edge to allow the tape to be easily pulled off after the seal shaft ring is mounted.

- Grease the seal lip and press in the seal shaft ring.
- Pull off the tape.



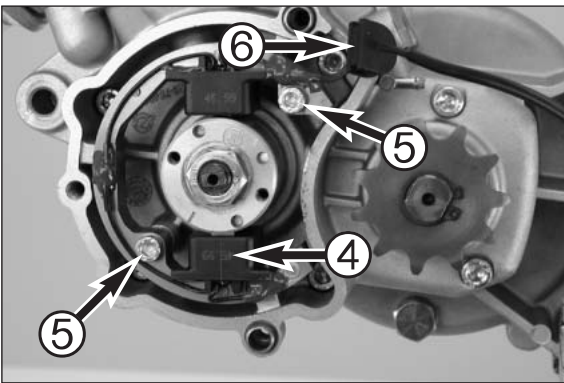
### Mounting the ignition

- Place woodruff key in the crankshaft groove.
- Mount ignition rotor ② with a washer, holding back with special tool, secure nut with Loctite 243 and tighten to 20 Nm (15 ft.lb).

#### ! CAUTION !

THE PINS ON THE SPECIAL TOOL MAY NOT ENGAGE IN THE ROTOR'S THREADED HOLES, OTHERWISE THE THREAD WILL BE DAMAGED.

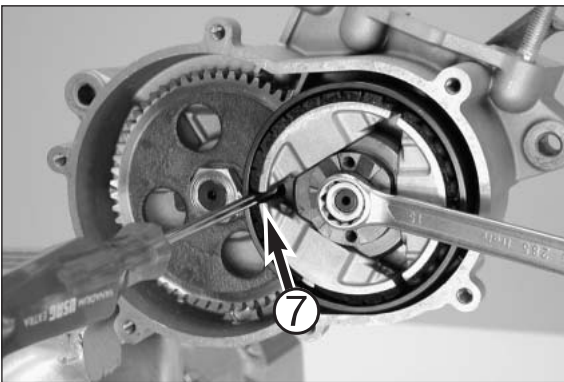
- Slide the chain sprocket ③ on the output shaft with the collar towards housing and mount the circlip.



- Mount ignition stator ④ in the case.

NOTE: for easier installation, gently press the stator together with your fingers. Check for a correct fit prior to bolting tight, stator may not cant.

- Secure allen bolts M5x25 ⑤ on the stators with Loctite 243 and tighten to 8 Nm (6 ft.lb).
- Position cable guide ⑥.



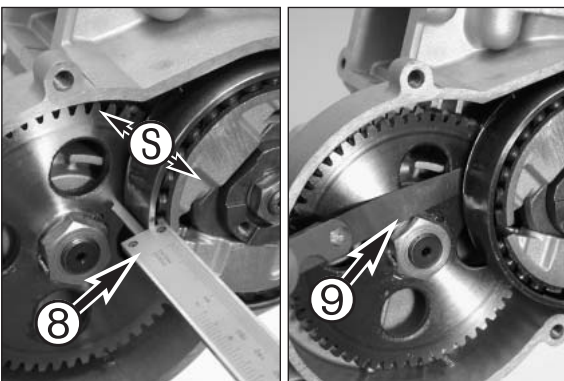
### Mount the clutch

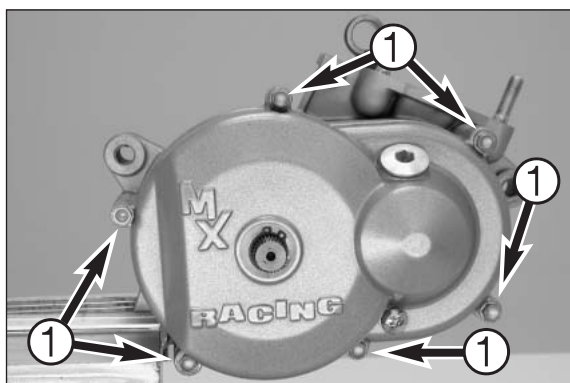
- Slide spacing washer(s) (25x15) onto the crankshaft, mount needle bearings and the centrifugal clutch unit.
- Block the centrifugal clutch, drum and gear of the primary drive with a suitable mandrel ⑦.
- Secure the nut M10x1.25 on the crankshaft with Loctite 243 and tighten to 35 Nm (25 ft.lb).
- Tighten the output shaft nut to 40 Nm (30 ft.lb).
- Bend over the lock washer on the output shaft nut.

NOTE: for a correct function of the centrifugal clutch axial clearance ⑧ between 0,2 and 0,7 mm (0,039 and 0,0055 in) must remain between the bottom of the drum and the clutch unit.

- Checking the axial clearance with a sliding gauge ⑧ by pressing the drum against the spacer and measure the distance from the upper edge of the drum to the drive wheel. Then pull the drum against the clutch unit, hold in position and measure again - the difference between these measurements is the axial clearance.
- Press drum against the spacing washers by hand and measure the distance between the drum and the gear of the primary drive using a feeler gauge ⑨ - it should be at least 0.5 mm.

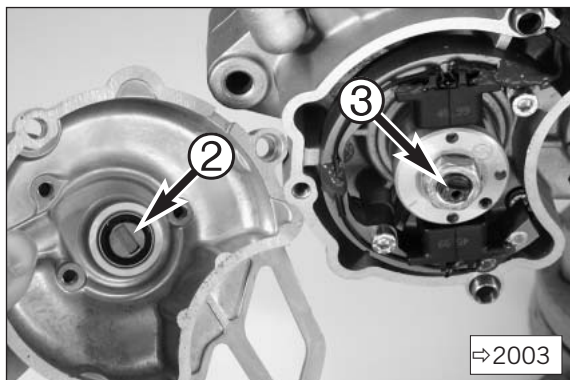
NOTE: if the clearances are outside of the tolerance zone, use spacing washers to balance. Spacing washers are available in different thicknesses.





### Mounting the clutch cover

- Put new seals in place and mount the clutch cover .
- Bolt clutch cover into place with 6 bolts M6x25 **1**, tighten the bolts to 10 Nm (7 ft.lb).



### Mount the ignition cover and water pump.

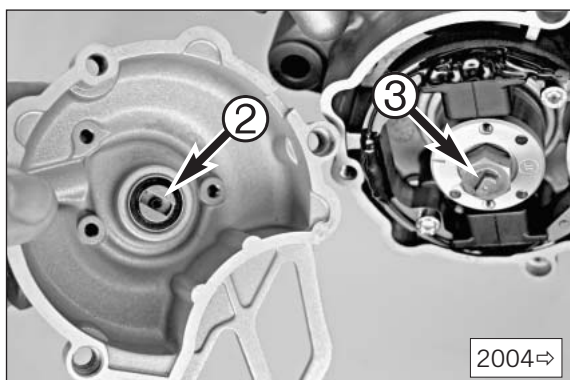
- Put the dowels 7x9x10 in place.
- Align the driving slot on the water pump drive **2** with the driver blade **3** on the crankshaft (LC-engine).

NOTE: make sure the spring is mounted in the water pump shaft (models from 2004).

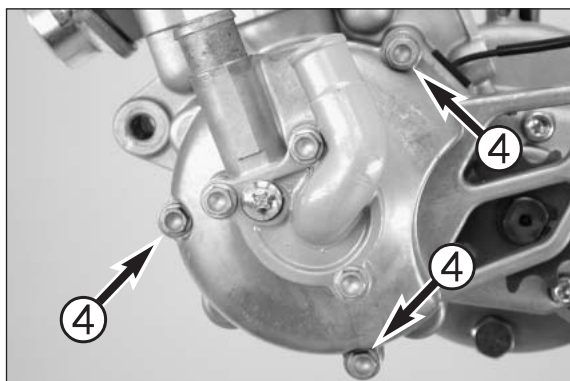
- Put cover on and engage by turning the pump drive cover back and forth.

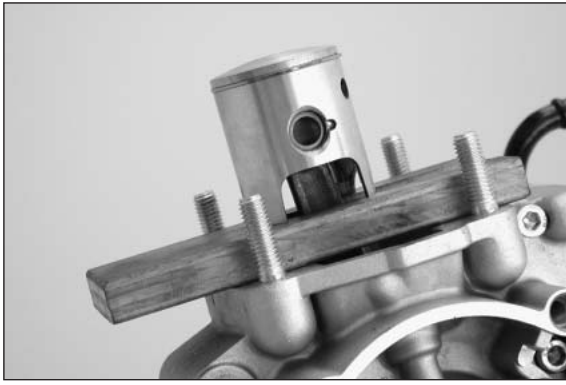
**! CAUTION !**

Do NOT TRY TO MOUNT THE IGNITION COVER BY FORCE, OTHERWISE COMPONENTS WILL BE DAMAGED.



- Bolt 3 HH bolts M6x25 **4** into ignition cover and tighten to 10 Nm (7 ft.lb).





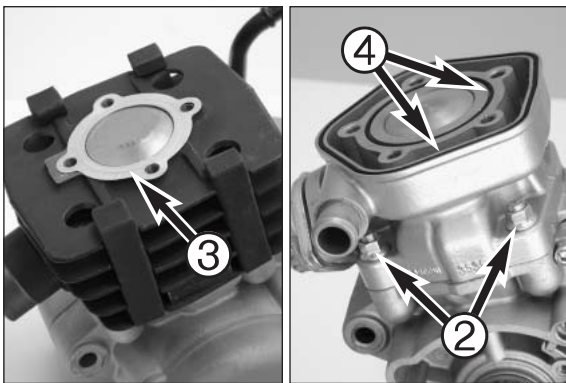
### Mount the pistons

- Fix conrod with a mounting board.
- Grease the conrod bearings and attach to conrod eye.
- Mount pistons, the arrow on the bottom of the piston should point towards the outlet port.
- Slide piston pin into the conrod eye by hand and mount piston pin lock with the open side facing down.

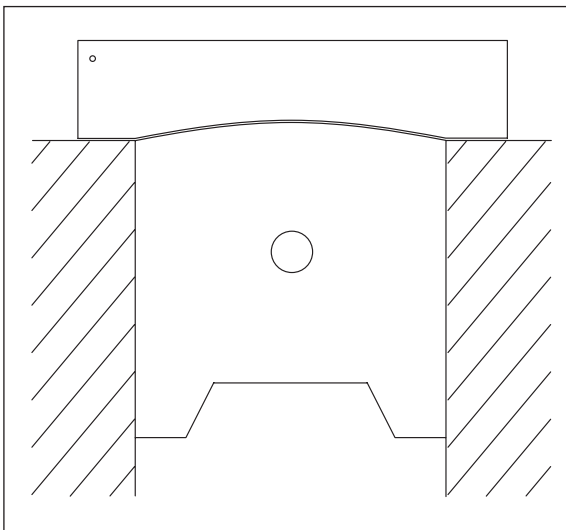


- Turn the piston ring until the anti-rotation device engages in the piston ring end gap ①.
- Mount cylinder base gasket, press piston rings together with your fingers and slide the greased cylinder over the pistons.

NOTE: if neither the pistons, cylinder, crankshaft or engine case are being replaced, the same seal thickness can be used as before.



- Tighten collar nut ② on the cylinder base bolting crosswise to a torque of 18 Nm (13 ft.lb).
- Mount a new seal ③ (AC-engine) or insert new O-rings ④ in the recesses (LC-engine).



### Adjust measurement „X“

NOTE:

- Measurement „X“ is the distance from the upper piston edge to the upper cylinder edge, piston set in TDC position and cylinder base bolts tightened.
- Measurement „X“ must be set with special care, adjusting various thicknesses of cylinder base gaskets.

!

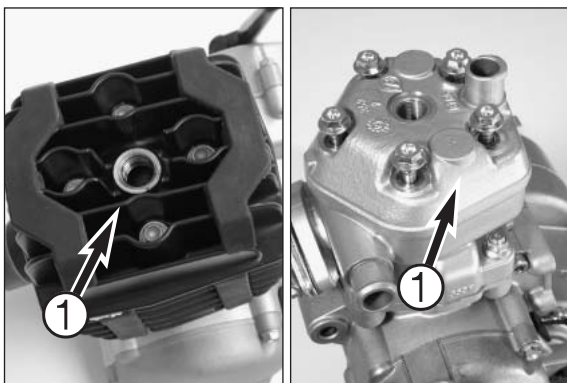
### CAUTION

!

IF THE „X“ MEASUREMENT IS TOO LARGE-THIS MEANS THAT A GAP IS VISIBLE BETWEEN PISTON AND ADJUSTING PLATE-THE COMPRESSION WILL SINK AND THE ENGINE WILL LOSE POWER. IF THE „X“ MEASUREMENT IS TOO SMALL-THIS MEANS THAT A GAP IS VISIBLE BETWEEN CYLINDER AND ADJUSTING PLATE-THE ENGINE WILL PING AND OVERHEAT.

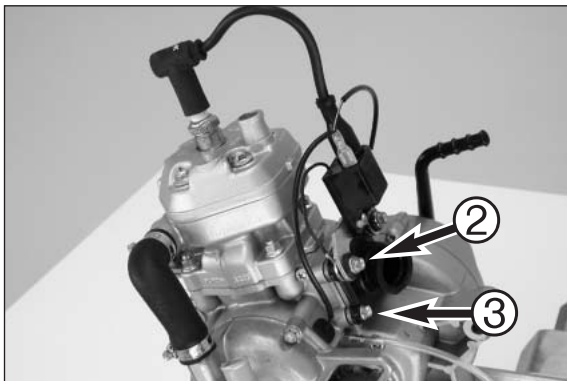
- Place the adjusting plate on the cylinder and set pistons to TDC (see diagram). If the „X“ measurement is correctly adjusted, the feeler gauge will lie flush on the pistons and on the cylinder.
- Adjust the „X“ measurement by adding or removing cylinder base gaskets.

NOTE: the „X“ measurement is increased by adding cylinder base gaskets and decreased by removing cylinder base gaskets.



### Mount the cylinder head

- Mount the cylinder head ❶, making sure the water connection is on the intake side (LC-engine).
- Use new washers for the cylinder head bolts (LC-engine), tighten cylinder head bolts crosswise in 2 stages to 15 Nm (11 ft.lb).

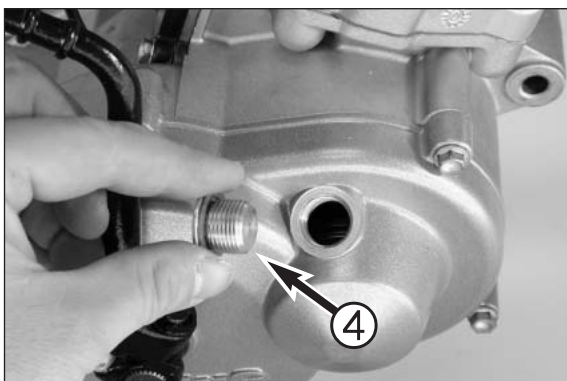


### Mount water hose, intake flange and ignition coil

- Apply water hose and tighten hose clamp (only LC-engine).
- Mount the reed valve housing and intake flange with new seal.

#### NOTE:

- the longer bolts (M6x40) ❷ are bolted into the upper holes, the bracket and the ground connection of the ignition coil are also fixed with these bolts.
- the shorter bolts (M6x20) ❸ are bolted into the lower holes.
- the intake flange should point to the chain sprocket.
- Bolt in the spark plug, spark plug cap and ignition connection, mount kickstarter and transmission vent hose.



### Fill in transmission oil

- Make sure the transmission drain plug is tightened to 15 Nm (11 ft.lb).
- Remove oil filler bolt ❹ and add 150-200 ccm gear oil Dexron II (Motorex ATF Super), remount oil filler bolt and tighten to 5 Nm (4 ft.lb).



# TROUBLE SHOOTING

# 7

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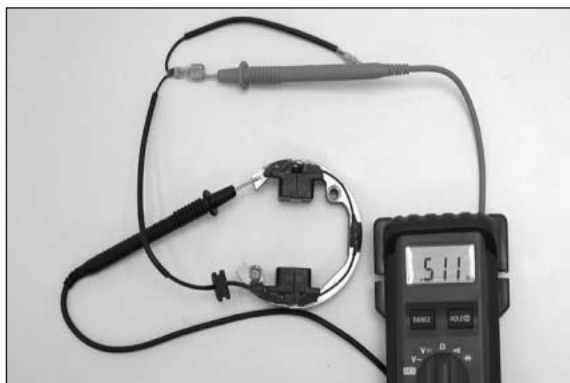




TROUBLE	CAUSE	REMEDY
Engine fails to start	<p>Operating error</p> <p>Fuel supply interrupted</p> <p>Electrode distance too large</p> <p>Plug fouled by oil, wet or bridged</p> <p>Ignition wire or spark plug connector damaged</p> <p>Kill button wire or short-circuit switch faulty</p> <p>Loose ignition cable connectors</p> <p>Spark too weak</p> <p>Water in the carburetor and jets blocked</p>	<p>Open fuel tap, replenish fuel, do not use choke</p> <p>Close fuel tap, loosen fuel hose at carburettor, lead into a basin and open fuel tap,  – if fuel leaks out, clean carburettor  – if no fuel leaks out, check tank ventilation, i.e. clean fuel tap</p> <p>Reduce electrode distance (0.60 mm) (0.0236 in)</p> <p>Clean spark plug or renew</p> <p>Dismount spark plug, connect ignition cable, hold to ground (blank place on engine) and actuate kickstarter, a strong spark must be produced at the spark plug  – If no spark is produced, loosen spark plug cap from ignition cable, hold about 5 mm from ground and actuate kickstarter  – If a spark now occurs, replace spark plug cap  – If no spark is produced, control ignition system</p> <p>Disconnect black coloured cable from short circuit button at ignition coil and check ignition spark. If the spark is O.K. repair defective part of cable or ignition switch</p> <p>Inspect cable connectors</p> <p>Examine ignition system</p> <p>Dismantle and clean carburetor</p>
Engine without idle running	<p>Idle adjusting bolt out of adjustment</p> <p>Ignition system damaged</p> <p>Wear</p>	<p>Readjust idle running or replace idle adjusting bolt</p> <p>Examine ignition system</p> <p>Overhaul engine</p>
Less power of engine	<p>Air filter obstructed</p> <p>Fuel supply partly interrupted or blocked</p> <p>Loss of compression due to loose spark plug</p> <p>Exhaust system damaged</p> <p>Engine has not enough preignition</p> <p>Reed paddles tensionless or damaged, surface of reed valve housing damaged</p> <p>Wear</p>	<p>Clean or renew airfilter</p> <p>Blow through fuel pipe and clean carburetor</p> <p>Tighten spark plug</p> <p>Check exhaust system for damage</p> <p>Check and adjust ignition</p> <p>Replace reed paddles or reed valve housing</p> <p>Overhaul engine</p>

## 7-3E

TROUBLE	CAUSE	REMEDY
Engine stalling or running with four stroke cycle	Carburetor overflows if level adjust too high, float needle seating is dirty or enlarged  Loose carburetor jets	Clean carburetor, if necessary replace float needle and adjust level  Tighten jets
High rpm misfiring	Incorrect heat range spark plug or low quality spark plug  Loose, corroded or non conductive ignition socket connector	Refer to technical data section  Check and seal with silicon
Engine splutters into the carburetor	Lack of fuel  Spark plug with incorrect heat value (Ignition by incandescence)  Engine takes air out of control	Clean fuel pipes, examine tank aeration and clean  Fit correct spark plug  Check intake flange and carburettor if firmly setted
Engine overheating	Insufficient liquid in cooling system (only LC-engine)  Radiator fins clogged (only LC-engine)  Frothing in cooling system (only LC-engine)  Pinched or kinked water hoses (only LC-engine)  Incorrect ignition timing because of loose stator bolts  Incorrect compression ratio	Top up coolant and bleed cooling system check cooling system for leaks  Clean radiator fins with water jet  Renew coolant using branded anti-freeze/anti-corrosive (Motorex Anti-Freeze)  Replace with correct routed hoses  Readjust to correct ignition timing specifications, secure bolts with Loctite 243  Measure and adjust compression ratio
Emission of white smoke (steam) (only LC-engine)	Cylinder head or O-ring of cylinder head gasket leaks	Check cylinder head, replace O-ring
Excessive oil escapes from transmission breather tube	Excessive oil quantity in transmission	Correct transmission oil level



### Resistor values of the ignition system - Stator

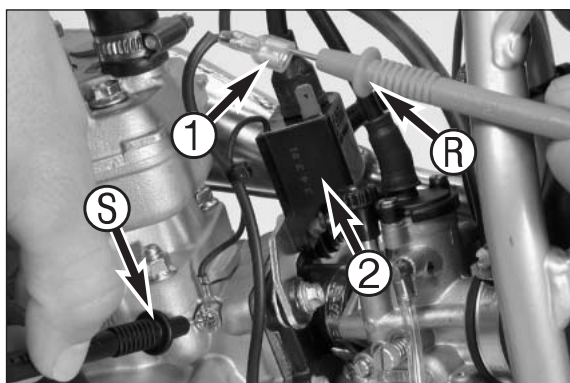
- Unplug the ignition stator and measure the resistance of the stator using a digital measuring tool.
- The resistance must be  $500 \Omega \pm 40 \Omega$  at  $20^\circ \text{C}$ .

NOTE: it is not necessary to take the stator out of the engine housing.



### Ignition coil

- Undo the spark plug cap
- Measure the resistor of the secondary side of the Ignition coil between high tension lead and mass of the coil.
- The resistance must be  $2250 \Omega \pm 250 \Omega$  at  $20^\circ \text{C}$ .



### Measuring static ignition values with peak voltage adapter

#### Measuring conditions:

- cold engine
- seat and tank removed
- all connector and socket connectors and the ground connection in a non-corroding condition
- kick the kick starter forcefully at least 5 times for each measurement

Check the **pulse generator/charging** coil for an output signal - one-pin connector **1**:

- Apply the red measuring lead **R** of the peak voltage adapter to the connector and the black measuring lead **S** to the ground, disconnect connector **1** from the ignition coil **2**

Multimeter display for 50 SX AC: 220 Volt  $\pm$  10 Volt

Multimeter display for 50 SX LC: 270 Volt  $\pm$ 10 Volt

- Same measurement with connector connected to the ignition coil

Multimeter display for 50 SX AC: 250 Volt  $\pm$ 10 Volt

Multimeter display for 50 SX LC: 270 Volt  $\pm$ 10 Volt



# TECHNICAL SPECIFICATIONS

# 8

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## TECHNICAL DATA - ENGINE 50 AC/LC 2002

Engine	50 AC (aircooled)	50 LC (liquid cooled)
Design	single cylinder 2-stroke engine, with reed valve inlet	
Displacement	49,0 cm <sup>3</sup>	
Bore/Stroke	39,5 / 40 mm	
Fuel	SUPER fuel, research octane no 95, mixed with 2-stroke oil	
Oil/gasoline ratio	1 : 40 when using high grade 2-stroke oil (Shell Advance Racing X) When in doubt, please contact your importer or use 1 : 33 mix ratio to be on the safe side	
Lubrication	mixture lubrication	
Crankshaft bearing	2 grooved ball bearing	
Connecting rod bearing	needle bearing	
Piston pin bearing	needle bearing	
Piston rings	1 rectangular ring	
Primary drive	straight cut spur gears, 16 : 57 t	
Transmission oil	0.15-0.2 liter gear oil Dexron II (Shell Donax TA)	
Spark plug	NGK BR 8 EH	NGK BR 10 EG
Electrode gap	0,6 mm	
Carburetor	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 14 DS / PHBG 19 BS
Air filter	wet foam type air filter insert	
Coolant	–	0.5 liter (0.132 USgal); water : coolant = 2 : 1

### BASIC CARBURETOR SETTING

Model	50 MINI ADVENTURE	50 JUNIOR/SENIOR ADVENTURE	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Type	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 14 DS	Dell'Orto PHBG 19 BS
Main jet	60 (70/80)	80 (70)	80	85
Needle jet	211 FA	211 FA	211 FA	260 AU
Idling jet	45	45	45	48
Jet needle	A10	A10	A10	W9
Needle position from top	3.	3.	3.	3.
Air/Mixture reg. screw open	3,5	3,5	3,5	3,0
Slide	40	40	40	60
Starting jet	60	60	60	60

## TECHNICAL SPECIFICATIONS - CHASSIS 50 MINI 2002

50 MINI ADVENTURE	50 JUNIOR ADVENTURE	50 SENIOR ADVENTURE	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
single downtube, split-cradle				
Marzocchi $\phi = 32$ mm				
Wheel travel front/rear	135/234 mm (5.3/9.2 in)	175/190 mm (6.9/7.5 in)	135/200 mm (5.3/7.8 in)	175/185 mm (6.9/7.3 in)
Rear suspension	Central shock absorber Paioli MC30			
Front brake	Drum brake $\phi$ 90 mm (3.5 in)			
Rear brake	Drumbrake $\phi$ 90 mm (3.5 in)			
Tyres	front/rear 2.50x10" VRM-140			
Tire pressure	front/rear: 1.0 bar / 1.0 bar			
Fuel tank capacity	1.8 Liter			
Final drive ratio	11 : 48			
Chain	1/2x3/16" 96 rolls	1/2x3/16" 104 rolls	1/2x3/16" 96 rolls	1/2x3/16" 104 rolls
Steering angle	62°	63°	64°	64°
Wheel base	910 mm (35.8 in)	914 mm (36 in)	1030 mm (40 in)	1030 mm (40 in)
Seat height, unloaded	590 mm (23.2 in)	615 mm (24.2 in)	650/675 mm (adjustable)(25.6/26.6 in)	650/675 mm (adjustable)(25.6/26.6 in)
Ground clearance	190 mm (7.5 in)	220 mm (8.6 in)	255 mm (10 in)	220 mm (8.6 in)
Dead weight without fuel	40 kg (88lbs)			
Rider's body height	max. 130 cm (5.1 in)			
Rider's body weight	max. 35 kg (78 lbs)			
Recommended age of rider	4 - 6 years		7 - 8 years	
Engine	50 AC		50 LC	

STANDARD-ADJUSTMENT - FORK		STANDARD ADJUSTMENT - SHOCK ABSORBER	
	50 AC	WP 0318W910	WP 0318W911
Spring	2,0 N/mm	5	5
Preload	10 mm (0.4 in)	85 N/mm	45 N/mm
Fork oil	SAE 7,5	7 mm/0.3 in	7 mm/0.3 in
Luftkammerlänge	110 mm (4.3 in)		

## TECHNICAL DATA - ENGINE 50 AC/LC 2003

Engine	50 AC (aircooled)	50 LC (liquid cooled)
Design	single cylinder 2-stroke engine, with reed valve inlet	
Displacement	49,0 cm <sup>3</sup>	
Bore/Stroke	39,5 / 40 mm	
Fuel	SUPER fuel, research octane no 95, mixed with 2-stroke oil (separate lubrication only ROZ 95)	
Oil/gasoline ratio	1 : 40 when using high grade 2-stroke oil (Shell Advance Racing X) (separate lubrication Shell Advance Ultra 2)	
Lubrication	mixture lubrication / separate lubrication	
Crankshaft bearing	2 grooved ball bearing	
Connecting rod bearing	needle bearing	
Piston pin bearing	needle bearing	
Piston rings	1 rectangular ring	
Primary drive	straight cut spur gears, 16 : 57 t	
Transmission oil	0.15-0.2 liter gear oil Dexron II (Shell Donax TA)	
Spark plug	NGK BR 8 ECM	
Electrode gap	0,6 mm (0.0236 in)	
Carburetor	Dell'Orto PHVA 14 DS / 12 XS	Dell'Orto PHVA 14 DS / PHBG 19 BS
Air filter	wet foam type air filter insert	
Coolant	–	0.5 liter (0.132 USgal) ; water : coolant = 2 : 1

### BASIC CARBURETOR SETTING

Model	50 MINI ADVENTURE (Separate lubrication) Dell'Orto PHVA 12 XS	50 JUNIOR/SENIOR ADVENTURE Dell'Orto PHVA 14 DS	50 SX PRO JUNIOR LC Dell'Orto PHVA 14 DS	50 SX PRO SENIOR LC Dell'Orto PHBG 19 BS
Type				
Main jet	60	80 (70)	80	85
Needle jet	211 FA	211 FA	211 FA	260 AU
Idling jet	38	45	45	48
Jet needle	A10	A10	A10	W9
Needle position from top	4.	3.	3.	3.
Air/Mixture reg. screw open	4	3,5	3,5	3,0
Slide	40	40	40	60
Starting jet	60	60	60	60

## TECHNICAL SPECIFICATIONS - CHASSIS 50 MINI 2003

50 MINI ADVENTURE	50 JUNIOR ADVENTURE	50 SENIOR ADVENTURE	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Frame	single downtube, split-cradle			
Fork	Marzocchi $\phi = 32$ mm			
Wheel travel front/rear	115/185 mm (4.5/7.3 in)	135/234 mm (5.3/9.2 in)	135/200 mm (5.3/7.8 in)	175/185 mm (6.9/7.3 in)
Rear suspension	Central shock absorber Paioli MC30			
Front brake	Drum brake $\phi$ 90 mm (3.5 in)			
Rear brake	Drumbrake $\phi$ 90 mm (3.5 in)			
Tyres front/rear	2.50x10" VRM-140			2.50x12" VeeRubber V270/275x10V271
Tire pressure	front/rear: 1.0 bar / 1.0 bar			
Fuel tank capacity	1.8 Liter			
Final drive ratio	11 : 48			
Chain	1/2x3/16" 96 rolls	1/2x3/16" 104 rolls	1/2x3/16" 96 rolls	1/2x3/16" 104 rolls
Steering angle	62°	63°	64°	64°
Wheel base	910 mm (35.8 in)	914 mm (36 in)	1030 mm (40 in)	1030 mm (40 in)
Seat height, unloaded	590/615 mm (adjustable)	615/640 mm (adjustable)	650/675 mm (adjustable)	650/675 mm (adjustable)
Ground clearance	(23.2/24.2 in) 190 mm (7.5 in)	(24.2/25.2 in) 220 mm (8.6 in)	(25.6/26.6 in) 255 mm (10 in)	(25.6/26.6 in) 255 mm (10 in)
Rider's body height	max. 130 cm (5.1 in)			
Rider's body weight	max. 35 kg (78 lbs)			
Recommended age of rider	4 - 6 years		6 - 10 years	
Engine	50 AC			
<b>STANDARD-ADJUSTMENT - FORK</b>				
	50 AC	50 LC		
Spring	2,0 N/mm	2,0 N/mm		
Preload	10 mm (0.4 in)	10 mm (0.4 in)		
Fork oil	SAE 7,5	SAE 7,5		
Air chamber length	(4.3 in)110 mm	110 mm (4.3 in)		
<b>STANDARD ADJUSTMENT - SHOCK ABSORBER AC</b>				
	50 JUNIOR Adventure	50 SENIOR Adventure		
Spring preload	8 mm/0.31 in	12 mm/0.47 in		
<b>STANDARD ADJUSTMENT - SHOCK ABSORBER</b>				
		WP 0318W910	WP 0318W911	
Rebound adjuster		5	5	
Spring		85 N/mm	45 N/mm	
Spring preload		7 mm/0.3 in	7 mm/0.3 in	

## TECHNICAL DATA - ENGINE 50 AC/LC 2004

Engine	MINI AC (separate lubrication)	SENIOR AC (mixture lubrication)	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Design		single cylinder 2-stroke engine, with reed valve inlet		
Displacement		49,0 cm <sup>3</sup>		
Bore/Stroke		39,5 / 40 mm		
Fuel	Lead-free SUPER FUELF (ROZ 95)	Lead-free SUPER FUEL (ROZ 95), mixed with 2-stroke oil		
Oil/gasoline ratio	–	1 : 40 when using high grade 2-stroke oil (Motorex 2T Cross Power) When in doubt, please contact your importer or use 1 : 33 mix ratio to be on the safe side		
Oil	high-grade two-stroke oils for separate lubrication Motorex Cross Power 2T	high-grade two-stroke oils for mixture lubrication Motorex Cross Power 2T		
Crankshaft bearing		2 grooved ball bearing		
Connecting rod bearing		needle bearing		
Piston pin bearing		needle bearing		
Piston rings		1 rectangular ring		
Primary drive		straight cut spur gears, 16 : 57 Z		
Transmission oil		0.15-0.2 liter gear oil Dexron II (Motorex ATF Super)		
Spark plug		NGK BR 8 ECM		
Electrode gap		0,6 mm		
Carburetor	Dell'Orto PHVA 12 XS	Dell'Orto PHVA 14 DS		Dell'Orto PHBG 19 BS
Air filter		wet foam type air filter insert		
Cooling liquid	–			0.5 litres, 40% antifreeze, 60% water, at least -25 °C

<b>BASIC CARBURETOR SETTING</b>		
Model	50 MINI ADVENTURE (SEPARATE LUBRICATION)	50 SENIOR ADVENTURE (MIXTURE LUBRICATION)
Type	Dell'Orto PHVA 12 XS	Dell'Orto PHVA 14 DS
Main jet	60	80 (70)
Needle jet	211 FA	211 FA
Idling jet	38	45
Jet needle	A10	A10
Needle position from top	4.	3.
Air/Mixture reg. screw open	4	3,5
Slide	40	40
Starting jet	60	60

<b>BASIC CARBURETOR SETTING</b>		
Model	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Type	Dell'Orto PHVA 14 DS	Dell'Orto PHBG 19 BS
Main jet	80	85
Needle jet	211 FA	211 FA
Idling jet	45	48
Jet needle	A10	W9
Needle position from top	3.	3.
Air/Mixture reg. screw open	3,5	3,0
Slide	40	60
Starting jet	60	60

## TECHNICAL SPECIFICATIONS - CHASSIS 50 MINI 2004

	50 MINI ADVENTURE	50 SENIOR ADVENTURE	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Frame	single downtube, split-cradle			
Fork	Marzocchi $\varnothing = 32$ mm			
Wheel travel front/rear	115/185 mm	175/190 mm	140/205 mm	185/185 mm
Rear suspension	Central shock absorber Paioli Central shock absorber WP PDS			
Front brake	Drum brake $\varnothing 90$ mm	Disk brake $\varnothing 160$ mm		
Rear brake	Drum brake $\varnothing 90$ mm			Disk brake $\varnothing 140$ mm
Tires front	2.50x10" Pirelli MT32A	2.50x12" Pirelli MT 32A	2.50x10" Pirelli MT32A	2.50x12" Pirelli MT 32A
Tires rear	2.75x10" Pirelli MT320			
Tire pressure front/rear	1,0 bar / 1,0 bar			
Fuel tank capacity	1,8 Liter			
Final drive ratio	11 : 48			11 : 44
Chain	1/2x3/16" 96 rolls	1/2x3/16" 104 rolls	1/2x3/16" 96 rolls	1/2x3/16" 104 rolls
Steering angle	66°			
Wheel base	910 mm	1030 mm	910 mm	1030 mm
Seat height, unloaded	590/615 mm (adjustable)	650/675 mm (adjustable)	585/610 mm (adjustable)	650/675 mm (adjustable)
BGround clearance, unloaded	190 mm	255 mm	220 mm	255 mm
Rider's body height	max. 130 cm			
Rider's body weight	max. 35 kg			
Recommended age of rider	4 - 6 years	4 - 7 years		6 - 10 years
Engine	50 AC 50 LC			

STANDARD-ADJUSTMENT - FORK		50 LC
Spring	2,0 N/mm	2,0 N/mm
Preload	10 mm (0.4 in)	10 mm (0.4 in)
Fork oil	SAE 7,5	SAE 7,5
Air chamber length	110 mm (4.3 in)	110 mm (4.3 in)

STANDARD ADJUSTMENT - SHOCK ABSORBER AC		
	50 MINI	50 SENIOR
Spring preload	8 mm/0.31 in	12 mm/0.47 in

STANDARD ADJUSTMENT - SHOCK ABSORBER LC		
	50 SX PRO JUNIOR	50 SX PRO SENIOR
Rebound adjuster	5	5
Spring	85 N/mm	45 N/mm
Spring preload	10 mm/0.4 in	7 mm/0.3 in

**TECHNICAL DATA – ENGINE 2005 AC**

<b>ENGINE</b>	<b>50 AC SENIOR ADVENTURE</b>	<b>50 AC MINI ADVENTURE</b>
Design	single cylinder 2-stroke engine, with reed valve inlet	
Displacement	49.0 ccm	
Bore/Stroke	39.5 / 40 mm	
Fuel	Lead-free SUPER FUEL (ROZ 95), mixed with 2-stroke oil	Lead-free SUPER FUEL (ROZ 95)
Lubrication	mixture lubrication	separate lubrication
Oil/gasoline ratio	1 : 40	–
2-stroke oil	high-grade two-stroke oils for mixture lubrication (Motorex Cross Power 2T)	high-grade two-stroke oils for separate lubrication (Motorex Cross Power 2T)
Crankshaft bearing	2 grooved ball bearing	
Connecting rod bearing	needle bearing	
Piston pin bearing	needle bearing	
Piston rings	1 rectangular ring	
Primary drive	straight cut spur gears, 16 : 57 t	
Transmission oil	0.15-0.2 liter gear oil Dexron II (Motorex ATF Super)	
Spark plug	NGK BR 8 ECM	
Electrode gap	0.6 mm	
Carburetor	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 12 XS
Airfilter	wet foam type air filter insert	

<b>BASIC CARBURETOR SETTING</b>		
<b>MODEL</b>	<b>50 SENIOR ADVENTURE</b>	<b>50 MINI ADVENTURE</b>
Type	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 12 XS
Main jet	80 (70)	65 (70)
Needle jet	211 FA	211 FA
Idling jet	45	38
Jet needle	A10	A10
Needle position from top	3.	4.
Air/Mixture reg. screw open	3.5	4
Slide	40	40
Starting jet	60	60



## TECHNICAL SPECIFICATIONS – CHASSIS 2005 AC

CHASSIS	50 SENIOR ADVENTURE	50 MINI ADVENTURE
Frame	single downtube, split-cradle	
Fork	Marzocchi Ø = 32 mm (1,26 in)	
Wheel travel front/rear	175/190 mm (6.9/7.5 in)	115/185 mm (4,5/7,3 in)
Rear suspension	Central shock absorber Paioli	
Front brake	Disk brake Ø 160 mm (6.4 in)	Drum brake Ø 90 mm (3,5 in)
Rear brake	Drumbrake Ø 90 mm (3,5 in)	
Tires front/rear	2.50x12" Pirelli MT32A / 2.75x10" MT320	2.50x10" Pirelli MT32A / 2.75x10" MT320
Tire pressure	front/rear: 1.0 bar / 1.0 bar	front/rear: 1.0 bar / 1.0 bar
Fuel tank capacity	2 liter (0.5 gallons)	
Final drive ratio	11 : 48	
Chain	1/2x3/16" 104 rolls	1/2x3/16" 96 rolls
Steering angle	66°	66°
Wheel base	1030 mm (40 in)	910 mm (35.8 in)
Seat height, unloaded	650 or 675 mm (25.6 or 26.6 in) adjustable	530 or 550 mm (21 or 21.7 in) adjustable
Ground clearance	255 mm (10 in)	182mm (7.2 in)
Rider's body height	max. 130 cm (51 in)	
Rider's body weight	max. 35 kg (78 lbs)	
Recommended age of rider	4 - 6 years	
Engine	50 AC	

### STANDARD-ADJUSTMENT – FORK

	50 SENIOR / MINI ADVENTURE
Spring	2,0 N/mm
Preload	10 mm (0.4 in)
Fork oil	SAE 7.5
Air chamber length	110 mm (4.3 in)

### STANDARD ADJUSTMENT – SHOCK ABSORBER

	50 SENIOR ADVENTURE	50 MINI ADVENTURE
Spring preload	12 mm (0.5 in)	8 mm (0.3. in)

**TECHNICAL DATA – ENGINE 2005 LC**

TYP	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Design	single cylinder 2-stroke engine, with reed valve inlet	
Displacement	49.0 ccm	
Bore/Stroke	39.5 / 40 mm	
Fuel	SUPER fuel, research octane no 95, mixed with 2-stroke oil	
Oil/gasoline ratio	1 : 40 when using high grade 2-stroke oil (Motorex 2T Cross Power) When in doubt, please contact your importer or use 1 : 33 mix ratio to be on the safe side	
Lubrication	mixture lubrication	
Crankshaft bearing	2 grooved ball bearing	
Connecting rod bearing	needle bearing	
Piston pin bearing	needle bearing	
Piston rings	1 rectangular ring	
Primary drive	straight cut spur gears, 16 : 57 Z	
Transmission oil	0.15-0,2 liter automatic gear oil Dexron II (Motorex Topspeed 4T 15W50)	
Spark plug	NGK BR 8 ECM	
Electrode gap	0.6 mm	
Carburetor	Dell'Orto PHVA 14 DS	Dell'Orto PHBG 19 BS
Air filter	wet foam type air filter insert	
Cooling liquid	0.5 litres, 40% antifreeze, 60% water, at least -25 °C (-13 °F)	

**BASIC CARBURETOR SETTING**

Model	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Type	Dell'Orto PHVA 14 DS	Dell'Orto PHBG 19 BS
Main jet	80	85
Needle jet	211 FA	260 AU
Idling jet	45	48
Jet needle	A10	W9
Needle position from top	3.	3.
Air/Mixture reg. screw open	3.5	3.0
Slide	40	60
Starting jet	60	60

## TECHNICAL SPECIFICATIONS - CHASSIS 2005 LC

	50 SX PRO JUNIOR LC	50 SX PRO SENIOR LC
Frame	single downtube, split-cradle	
Fork	Marzocchi Ø = 32 mm (1.26 in)	
Wheel travel front/rear	140/205 mm (5.5/8 in)	185/185 mm (7.3/7.3 in)
Rear suspension	Central shock absorber WP	
Front brake	Disk brake Ø 160 mm (6.4 in)	
Rear brake	Drum brake Ø 90 mm (3.5 in)	Disk brake Ø 140 mm (5.5 in)
Tires front/rear	2.50x10" Pirelli MT32A / 2.75x10" MT320	2.50x12" Pirelli MT32A / 2.75x10" MT320
Tire pressure	front/rear: 1.0 bar	
Fuel tank capacity	1.8 Liters	
Final drive ratio	11 : 48	10 : 44
Chain	1/2x3/16" 96 rolls	1/2x3/16" 102 rolls
Steering angle	66°	66°
Wheel base	910 mm (35.8 in)	1030 mm (40 in)
Seat height, unloaded	585 mm/610 mm (23/24 in)	650/675 mm (25.6/26.6 in)
Ground clearance	220 mm (8.6 in)	255 mm (10 in)
Rider's body height	max. 130 cm (51 in)	
Rider's body weight	max. 35 kg (78 lbs)	
Recommended age of rider	4-7 years	6-10 years
Engine	50 LC	

### STANDARD-ADJUSTMENT – FORK

Spring	2.0 N/mm
Preload	10 mm (0.4 in)
Fork oil	SAE 7.5
Air chamber length	110 mm (4.3 in)

### STANDARD ADJUSTMENT – SHOCK ABSORBER

	JUNIOR LC WP 03189A01	SENIOR LC WP 03189A02
Rebound adjuster	5	5
Spring	85 N/mm	45 N/mm
Spring preload	10 mm (0.39 in)	7 mm (0.28 in)

**TECHNICAL DATA – ENGINE 2006 AC**

<b>ENGINE</b>	<b>50 SENIOR ADVENTURE</b>	<b>50 MINI ADVENTURE</b>
Design	single cylinder 2-stroke engine, with reed valve inlet	
Displacement	49.0 ccm	
Bore/Stroke	39.5 / 40 mm	
Fuel	Lead-free SUPER FUEL (ROZ 95), mixed with 2-stroke oil	Lead-free SUPER FUEL (ROZ 95)
Lubrication	mixture lubrication	separate lubrication
Oil/gasoline ratio	1 : 60	–
2-stroke oil	high-grade two-stroke oils for mixture lubrication (Motorex Cross Power 2T)	high-grade two-stroke oils for separate lubrication (Motorex Cross Power 2T)
Crankshaft bearing	2 grooved ball bearing	
Connecting rod bearing	needle bearing	
Piston pin bearing	needle bearing	
Piston rings	1 rectangular ring	
Primary drive	straight cut spur gears, 16 : 57 t	
Transmission oil	0.15-0.2 liter gear oil Dexron II (Motorex ATF Super)	
Spark plug	NGK BR 8 ECM	
Electrode gap	0.6 mm	
Carburetor	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 12 XS
Airfilter	wet foam type air filter insert	

<b>BASIC CARBURETOR SETTING</b>		
<b>MODEL</b>	<b>50 SENIOR ADVENTURE</b>	<b>50 MINI ADVENTURE</b>
Type	Dell'Orto PHVA 14 DS	Dell'Orto PHVA 12 XS
Main jet	80 (70)	65 (70)
Needle jet	211 FA	211 FA
Idling jet	45	38
Jet needle	A10	A10
Needle position from top	3.	4.
Air/Mixture reg. screw open	3.5	4
Slide	40	40
Starting jet	60	60

## TECHNICAL SPECIFICATIONS – CHASSIS 2006 AC

CHASSIS	50 SENIOR ADVENTURE	50 MINI ADVENTURE
Frame	single downtube, split-cradle	
Fork	Marzocchi Ø = 32 mm (1,26 in)	
Wheel travel front/rear	175/190 mm (6.9/7.5 in)	115/185 mm (4,5/7,3 in)
Rear suspension	Central shock absorber Paioli	
Front brake	Disk brake Ø 160 mm (6.4 in)	Drum brake Ø 90 mm (3,5 in)
Rear brake	Drumbrake Ø 90 mm (3,5 in)	
Tires front/rear	2.50x12" Pirelli MT32A / 2.75x10" MT320	2.50x10" Pirelli MT32A / 2.75x10" MT320
Tire pressure	front/rear: 1.0 bar / 1.0 bar	front/rear: 1.0 bar / 1.0 bar
Fuel tank capacity	2 liter (0.5 gallons)	
Final drive ratio	11 : 48	
Chain	1/2x3/16" 104 rolls	1/2x3/16" 96 rolls
Steering angle	66°	66°
Wheel base	1030 mm (40 in)	910 mm (35.8 in)
Seat height, unloaded	650 or 675 mm (25.6 or 26.6 in) adjustable	530 or 550 mm (21 or 21.7 in) adjustable
Ground clearance	255 mm (10 in)	182mm (7.2 in)
Rider's body height	max. 130 cm (51 in)	
Rider's body weight	max. 35 kg (78 lbs)	
Recommended age of rider	4 - 6 years	
Engine	50 AC	

### STANDARD-ADJUSTMENT – FORK

	50 SENIOR / MINI ADVENTURE
Spring	2,0 N/mm
Preload	10 mm (0.4 in)
Fork oil	SAE 7.5
Air chamber length	110 mm (4.3 in)

### STANDARD ADJUSTMENT – SHOCK ABSORBER

	50 SENIOR ADVENTURE	50 MINI ADVENTURE
Spring preload	12 mm (0.5 in)	8 mm (0.3. in)

**TECHNICAL DATA – ENGINE 2006 LC**

TYP	50 SX JUNIOR	50 SX, 50 SUPERMOTO
Design	single cylinder 2-stroke engine, with reed valve inlet	
Displacement	49.0 ccm	
Bore/Stroke	39.5 / 40 mm	
Fuel	SUPER fuel, research octane no 95, mixed with 2-stroke oil	
Oil/gasoline ratio	1 : 60 when using high grade 2-stroke oil (Motorex 2T Cross Power) When in doubt, please contact your importer	
Lubrication	mixture lubrication	
Crankshaft bearing	2 grooved ball bearing	
Connecting rod bearing	needle bearing	
Piston pin bearing	needle bearing	
Piston rings	1 rectangular ring	
Primary drive	straight cut spur gears, 16 : 57 Z	
Transmission oil	0.15-0,2 liter automatic gear oil Dexron II (Motorex Topspeed 4T 15W50)	
Spark plug	NGK BR 8 ECM	
Electrode gap	0.6 mm	
Carburetor	Dell'Orto PHVA 14 DS	Dell'Orto PHBG 19 BS
Air filter	wet foam type air filter insert	
Cooling liquid	0.5 litres, 50% antifreeze, 50% water, at least -25 °C (-13 °F)	

**BASIC CARBURETOR SETTING**

Model	50 SX JUNIOR	50 SX, 50 SUPERMOTO
Type	Dell'Orto PHVA 14 DS	Dell'Orto PHBG 19 BS
Main jet	80	85
Needle jet	211 FA	260 AU
Idling jet	45	48
Jet needle	A10	W9
Needle position from top	3.	3.
Air/Mixture reg. screw open	3.5	3.0
Slide	40	60
Starting jet	60	60

## TECHNICAL SPECIFICATIONS - CHASSIS 2006 LC

	50 SX JUNIOR	50 SX	50 SUPERMOTO
Frame	single downtube, split-cradle		
Fork	Marzocchi Ø = 32 mm (1.26 in)		
Wheel travel front/rear	140/205 mm (5.5/8 in)	185/185 mm (7.3/7.3 in)	
Rear suspension	Central shock absorber WP		
Front brake	Disk brake Ø 160 mm (6.4 in)		
Rear brake	Drum brake Ø 90 mm (3.5 in)	Disk brake Ø 140 mm (5.5 in)	
Tires front	2.50x10" Pirelli MT32A	2.50x12" Pirelli MT32A	90/90-10 Pirelli SL26
Tires rear	2.75x10" MT320		90/90-10 Pirelli SL26
Tire pressure	front/rear: 1.0 bar		
Fuel tank capacity	1,8 Liter		
Final drive ratio	11 : 48	10 : 44	
Chain	1/2 x 3/16" 96 rolls	1/2 x 3/16" 102 rolls	
Steering angle	66°		
Wheel base	910 mm (35.8 in)	1030 mm (40 in)	
Seat height unloaded	585 mm/610 mm (23/24 in)	650/675 mm (25.6/26.6 in)	
Ground clearance unloaded	220 mm (8.6 in)	255 mm (10 in)	
Rider's body height	max. 130 cm (51 in)		
Rider's body weight	max. 35 kg (78 lbs)		
Recommended age of rider	4 - 7 years	6 - 10 years	
Engine	50 LC		

### STANDARD-ADJUSTMENT – FORK

Spring	2,0 N/mm
Preload	10 mm (0.4 in)
Fork oil	SAE 7,5
Air chamber length	110 mm (4.3 in)

### STANDARD ADJUSTMENT – SHOCK ABSORBER

	50 SX JUNIOR WP 03189B01	50 SX, 50 SUPERMOTO WP 03189B02
Rebound adjuster	5	5
Spring	85 N/mm	45 N/mm
Spring preload	10 mm (0.39 in)	7 mm (0.28 in)

TOLERANCES AND FITTING CLEARANCES		
Crankshaft	run out of crank stud	max. 0.050 mm
Crankshaft webs	outer dimension	38 mm $\pm$ 0.05 mm
Conrod bearing	radial play	max. 0.030 mm
Piston	fitting clearance	0.055-0.065 mm (AC) / 0.045-0.055 mm (LC)
Piston ring	end gap	max. 0.20 mm
Clutch shoes	outer diameter	new 82.5 mm
Clutch drum	diameter	max. 84.4 mm (new 84.00 - 84.01 mm)
Clutch springs (AC)	length	min. 19.6 mm

TIGHTENING TORQUES - ENGINE		
Hexagon nut primary gear	M14x1.25	40 Nm
Hexagon nut ignition rotor	M10x1.25	20 Nm
Hexagon nut of clutch hub	M10x1.25	Loctite 243 + 35 Nm
HH bolts clutch shoes	M6	Loctite 243 + 12 Nm
Cylinder head bolts	M7	15 Nm
Cylinder base nuts	M8	18 Nm
Allen head bolt-Stator	M5	Loctite 243 + 8 Nm
Oil plug	M16	5 Nm
Oil drain plug	M10	15 Nm
Other bolts engine	M5	7 Nm
	M6	10 Nm
	M8	30 Nm

TIGHTENING TORQUES - CHASSIS		
Hexagon nuts front/rear axle	M12x1	40 Nm
Hexagon nut swing arm bolt	M10	45 Nm
	M12	40 Nm
HH bolts of top triple clamp	M8	20 Nm
HH bolts of bottom triple clamp	M6	10 Nm
	M8	15 Nm
HH bolts handlebar clamp	M8	20 Nm
Shock absorber top/bottom	M10	45 Nm
Allen head bolt - Handlebar support	M10	Loctite + 40 Nm
Front brake caliper	M8	Loctite + 20 Nm
Front brake disk	M6	Loctite + 10 Nm
Fixing screw brake pads	M6	4 Nm
Spoke nipple	Mini Adventure	2,0 - 2,5 Nm
	SX / Senior Adventure / Supermoto	2,5 - 3,0 Nm
Other bolts chassis	M5	6 Nm
	M6	10 Nm
	M8	25 Nm
	M10	45 Nm



# LUBRICATION AND MAINTENANCE SCHEDULE 9

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## PERIODIC MAINTENANCE 2002

 50 MINIS  
air/liquid cooled

A washed motorcycle can be checked more quickly which saves money!		Service every 5 hours	Service every 20 hours
ENGINE	Check engine for leaks	●	
	Change transmission oil	●	
	Check spark plug, change it if necessary, set electrode gap		●
	Check the clutch engagement speed	●	
CARBURETOR	Check carburetor for tight fit at intake flange		●
	Check intake flange for cracks		●
	Check idle setting when engine is warm		●
ADD-ON-PARTS	Check cooling system for leaks, antifreeze protection		●
	Check exhaust system for leaks and suspension		●
	Check actuating cables for damage, smooth operation, and kink-less arrangement, adjust and lubricate	●	
	Clean air filter and air filter box	●	
BRAKES	Check fluid level, lining thickness, brake discs		●
	Check brake lines for damage		●
	Check/adjust smooth operation, free travel of hand/footbrake levers	●	
	Check bolts of brake system for tight fit	●	
CHASSIS	Check suspension strut and fork for leaks and proper function		●
	Check swinging-fork pivot		●
	Check/adjust steering-head bearing		●
	Check all chassis bolts for tight fit (fork plates, axle nuts, swinging-fork pivot, suspension strut)		●
WHEELS	Check spoke tension and rim joint	●	
	Check tire condition and inflation pressure		●
	Check chain, chain wheels, chain wheel guides for wear, tight fit, and tension	●	
	Lubricate chain	●	
	Check wheel bearings for play	●	

### IMPORTANT RECOMMENDED MAINTENANCE PROCEDURES TO BE PERFORMED BASED ON A SEPARATE SUPPLEMENTARY ORDER

	once a year
Drain and clean the carburetor's float chamber	●
Perform complete fork maintenance	●
Clean and lubricate the swinging-arm bearing	●
Clean and lubricate the steering-head bearing and sealing elements	●
Change brake fluid	●

MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE OF CARE AND CHECKS DONE BY THE RIDER!

**VITAL CHECKS AND CARE PROCEDURES TO BE CONDUCTED BY THE OWNER OR THE MECHANIC**

	before each start	after every cleaning	for cross country use	once a year
Check transmission oil level	●			
Check coolant level	●			
Check brake fluid level	●			
Check brake pads for wear	●			
Check brake performance	●	●		
Lubricate and adjust actuating cables and nipples		●		
Remove and clean dust sleeves of telescopic fork in regular intervals			●	
Clean and lubricate chain, check tension and readjust it if necessary		●	●	
Clean air filter and filter box			●	
Check tire inflation pressure and wear	●			
Check fuel line for leaks	●			
Drain and clean float chamber		●		
Verify smooth operation of all controls	●			
Treat exposed metal components (except for the brake and exhaust systems) with wax-based anti-corrosion agents		●		
Check all bolts, nuts, and hose clamps for their tight fit in regular intervals				●

<b>KTM</b>		<b>PERIODIC MAINTENANCE 2003-2005</b>		50 MINIS air/liquid cooled
A washed motorcycle can be checked more quickly which saves money!		Service every 5 hours	Service every 20 hours	
ENGINE	Check engine for leaks	●		
	Change transmission oil	●		
	Check spark plug, change it if necessary, set electrode gap		●	
	Check the clutch engagement speed	●		
CARBURETOR	Check carburetor for tight fit at intake flange		●	
	Check intake flange for cracks		●	
	Check idle setting when engine is warm		●	
ADD-ON-PARTS	Check cooling system for leaks, antifreeze protection		●	
	Check exhaust system for leaks and suspension		●	
	Check actuating cables for damage, smooth operation, and kink-less arrangement, adjust and lubricate	●		
	Clean air filter and air filter box	●		
BRAKES	Check fluid level, lining thickness, brake discs		●	
	Check brake lines for damage		●	
	Check/adjust smooth operation, free travel of hand/footbrake levers	●		
	Check bolts of brake system for tight fit	●		
CHASSIS	Check suspension strut and fork for leaks and proper function		●	
	Check swinging-fork pivot		●	
	Check/adjust steering-head bearing		●	
	Check all chassis bolts for tight fit (fork plates, axle nuts, swinging-fork pivot, suspension strut)		●	
WHEELS	Check spoke tension and rim joint	●		
	Check tire condition and inflation pressure		●	
	Check chain, chain wheels, chain wheel guides for wear, tight fit, and tension	●		
	Lubricate chain	●		
	Check wheel bearings for play	●		
<b>IMPORTANT RECOMMENDED MAINTENANCE PROCEDURES TO BE PERFORMED BASED ON A SEPARATE SUPPLEMENTARY ORDER</b>				
			once a year	
Drain and clean the carburetor's float chamber			●	
Perform complete fork maintenance			●	
Clean and lubricate the swinging-arm bearing			●	
Clean and lubricate the steering-head bearing and sealing elements			●	
Change brake fluid			●	

MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE OF CARE AND CHECKS DONE BY THE RIDER!

**VITAL CHECKS AND CARE PROCEDURES TO BE CONDUCTED BY THE OWNER OR THE MECHANIC**

	before each start	after every cleaning	for cross country use	once a year
Check transmission oil level	●			
Check cooling liquid level	●			
Check brake fluid level	●			
Check brake pads for wear	●			
Check brake performance	●	●		
Lubricate and adjust actuating cables and nipples		●		
Remove and clean dust sleeves of telescopic fork at regular intervals			●	
Clean and lubricate chain, check tension and readjust it if necessary		●	●	
Clean air filter and filter box			●	
Check tire inflation pressure and wear	●			
Check fuel line for leaks	●			
Drain and clean float chamber		●		
Verify smooth operation of all controls	●			
Treat exposed metal components (except for the brake and exhaust systems) with wax-based anti-corrosion agents		●		
Check all bolts, nuts, and hose clamps for their tight fit at regular intervals				●

**RECOMMENDED INSPECTION OF THE MINI AC/LC ENGINE BY YOUR KTM WORKSHOP (ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

	30 hours	45 hours	60 hours	90 hours	120 hours	135 hours
Check the reed-type intake valve for wear	●	●	●	●	●	●
Check the clutch shoes for wear	●	●	●	●	●	●
Check the length of the clutch springs (AC)	●	●	●	●	●	●
Check the clutch drum for wear	●	●	●	●	●	●
Check the water pump shaft and bearings for wear	●	●	●	●	●	●
Check the water pump wheel for wear	●	●	●	●	●	●
Check the cylinder and piston for wear	●	●	●	●	●	●
Check the eccentricity of the crankshaft journal	●	●	●	●	●	●
Check the radial clearance of the conrod bearings	●		●		●	
Check the radial clearance of the piston pin main bearing	●		●		●	
Check the crankshaft main bearing for wear	●		●		●	
Replace the crankshaft bearings and conrod bearings		●		●		●
Check the entire transmission including bearings for wear		●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.

<b>KTM</b>		<b>PERIODIC MAINTENANCE 2006</b>		50 MINIS air/liquid cooled
A washed motorcycle can be checked more quickly which saves money!		Service every 5 hours	Service every 20 hours	before every race
<b>ENGINE</b>	Check engine for leaks	●	●	
	Change transmission oil	●	●	
	Check spark plug, change it if necessary, set electrode gap		●	
	Check the clutch engagement speed	●		●
<b>CARBURETOR</b>	Check carburetor for tight fit at intake flange		●	
	Check intake flange for cracks		●	
	Check idle setting when engine is warm		●	
<b>ADD-ON-PARTS</b>	Check cooling system for leaks, antifreeze protection		●	
	Check exhaust system for leaks and correct fit		●	
	Check actuating cables for damage, smooth operation, and kink-less arrangement, adjust and lubricate	●	●	●
	Clean air filter and air filter box	●	●	●
<b>BRAKES</b>	Check fluid level, lining thickness, brake discs		●	●
	Check brake lines and brake control cables for damage		●	●
	Check/adjust function, smooth operation and free travel of hand/footbrake levers	●	●	●
	Check bolts of brake system for tight fit	●	●	●
<b>CHASSIS</b>	Check suspension strut and fork for leaks and proper function		●	●
	Check swinging-fork pivot		●	●
	Check/adjust steering-head bearing		●	●
	Check all chassis bolts for tight fit (fork plates, axle nuts, swinging-fork pivot, suspension strut)		●	●
<b>WHEELS</b>	Check spoke tension and rim joint	●	●	●
	Check tire condition and inflation pressure		●	●
	Check chain, chain wheels, chain wheel guides for wear, tight fit, and tension	●	●	●
	Lubricate chain	●	●	●
	Check wheel bearings for play	●	●	●
<b>IMPORTANT RECOMMENDED MAINTENANCE PROCEDURES TO BE PERFORMED BASED ON A SEPARATE SUPPLEMENTARY ORDER</b>				
				once a year
Drain and clean the carburetor's float chamber				●
Perform complete fork maintenance				●
Clean and lubricate the swinging-arm bearing				●
Clean and lubricate the steering-head bearing and sealing elements				●
Change brake fluid				●

MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE OF CARE AND CHECKS DONE BY THE RIDER!

**VITAL CHECKS AND CARE PROCEDURES TO BE CONDUCTED BY THE OWNER OR THE MECHANIC**

	before each start	after every cleaning	for cross country use	once a year
Check transmission oil level	●			
Check cooling liquid level	●			
Check brake fluid level	●			
Check brake pads for wear	●			
Check brake performance	●	●		
Lubricate and adjust actuating cables and nipples		●		
Remove and clean dust sleeves of telescopic fork at regular intervals			●	
Clean and lubricate chain, check tension and readjust it if necessary		●	●	
Clean air filter and filter box			●	
Check tire inflation pressure and wear	●			
Check fuel line for leaks	●			
Drain and clean float chamber		●		
Check oil lines for cracks or kinks (for separate lubrication only)	●			
Verify smooth operation of all controls	●			
Treat exposed metal components (except for the brake and exhaust systems) with wax-based anti-corrosion agents		●		
Check all bolts, nuts, and hose clamps for their tight fit at regular intervals				●

**RECOMMENDED INSPECTION OF THE MINI AC/LC ENGINE BY YOUR KTM WORKSHOP (ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

	after every 20 hours	after every 40 hours
Check the reed-type intake valve for wear	●	●
Check the clutch shoes for wear	●	●
Check the length of the clutch springs (AC)	●	●
Check the clutch drum for wear	●	●
Check the water pump shaft and bearings for wear	●	●
Check the water pump wheel for wear	●	●
Check the cylinder and piston for wear	●	●
Check the oil pump (only separate lubrication)	●	●
Check the eccentricity of the crankshaft journal	●	●
Check the radial clearance of the conrod bearings	●	
Check the radial clearance of the piston pin main bearing	●	
Check the crankshaft main bearing for wear	●	
Replace the crankshaft bearings and conrod bearings		●
Check the entire transmission including bearings for wear		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.





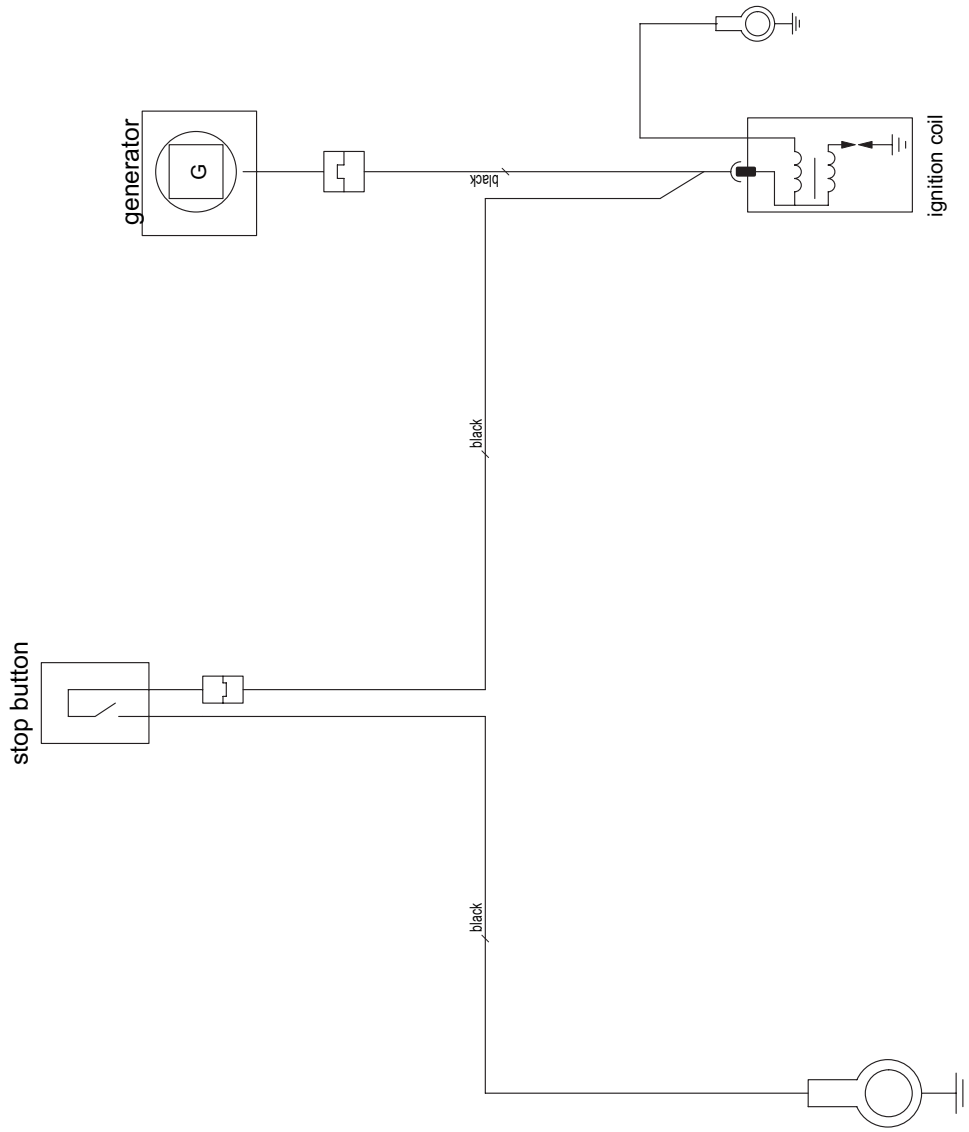
# WIRING DIAGRAM

# 10

## INDEX

<b>WIRING DIAGRAM</b> .....	<b>10-2</b>
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Cable colours:  
black = black



Mini Ad.-SX Senior 50 LC

20.02.2004